Order Iniomi

Premaxillaries well developed, excluding maxillaries from edge of upper jaw. Opercular appartus sometimes incomplete. Gill openings wide. Gills 4, slit after fourth. Pharyngeal bones unmodified. Air bladder small or absent, with duct when present. Ovaries with oviducts. Skeleton mostly weakly ossified. Front vertebrae simple, unmodified, without auditory ossicles; vertebral centra coossified with arches. Mesocoracoid arch usally absent or atrophied. Shoulder girdle with posttemporal not normally united with skull, though touching same at or near nape. Scales mostly cycloid, often absent. Photophores usually present. Dorsal and anal fins without true spines. Ventrals, when present, abdominal. Adipose fin variously present or absent.

Marine fishes, mostly bathypelagic. Though allied with the herring and salmon like groups they differ in the absence of the mesocoracoid bone and the connection of the shoulder girdle with the skull imperfect. Following Parr's contention the Cetuncule are here omitted and ranged with the Xenoberyces.

Analysis of families

a[1]. Myctophoidea. Mouth not or but little protractile; interopercle not reduced; clavicle attached to supraclavicle at lower end of latter.

b[1]. No photophores.

c[1]. Teeth in jaws in bands of several series.

d[1]. Dorsal postmedian; rays of some fins filamentous. Aulopidae.

d[2]. Dorsal premedian; rays of fins without filaments. Synodontidae.

c[2]. Teeth uniserial or in very narrow bands in jaws; some lower or palatine teeth may be fang like.

b[2]. Photophores present, rarely or only occasionally absent. Myctophidae.

a[2]. Alepidosauroidea. Mouth not protractile; dentition strong; interopercle reduced; clavicle attached to supraclavicle at or near upper end of latter, which extends downward and backward and has upper postclavicle attached to its terminal end.

e[1]. Eyes not telescopic.

f[1]. Eye normal, without orbital cavity expanded downward.

g^1. Dorsal moderate, postmedian; ventral opposite dorsal; size small. Omosudidae.

g^2. Dorsal very large, high, occupies most of back; ventral nearer pectoral than anal; size large. Alepidosauridae.

f^2. Eye with orbital cavity expanded downward. Evermannellidae.

e^2. Eyes mostly telescopic, lateral, directed upward. Scopelarchidae.

Family AULOPIDAE

Body moderately to slenderly elongate, little compressed or subcylindrical. Eyes lateral. Mouth slightly protractile, terminal, rather wide. Maxillary long, reaches hind eye edge or beyond. Vomerine teeth forms single transverse series. Branchiostegals long, curved, numerous. No air vessel. Vertebrae 52. Scales moderate or small. Sometimes rows of luminous spots or photophores along belly. Dorsal premedian or median. Anal postmedian. Pectoral rather low. Ventrals widely separated, rays 9, inserted below or little behind pectorals.

Although Regan has placed the Ateleopoidea as a suborder of the Iniomi, chiefly on certain osteological resemblences with Aulopus, especially its shoulder girdle, it does not appear to me closely related. Its peculiar physiognomy, even if only superficial, certainly recalls the jugular ventrals of the brotulids, macrurids, or such groups. Macristium, which Regan also places as probably related to Aulopsis is arranged with the clupeoids near the Alepocephalidae by Jordan.

Analysis of genera

a^1. Body moderately long; no photophores; dorsal premedian. Aulopus.

a^2. Body very slender and elongate; 3 ventral rows of photophores each side; dorsal median. Scopelosaurus.

Genus Aulopus Cloquet

Aulopus (CUVIER) CLOQUET, Dict. Sci. Nat. Paris, ed. 2, vol. 3, Suppl., Oct. 1816, p. 128. Type Salmo filamentosus BLOCH, monotypic. -- CUVIER, Regne Animal, ed. 1, vol. 2, 1817 (Dec. 1816), p. 170. Type Salmo filamentosus BLOCH.

Hirne STARKS, Copeia, No. 127, March 29, 1924, p. 30.

Type Aulopus japonicus GUNTHER, orthotypic.

Body rather elongate, slightly compressed. Head large. Muzzle rather short. Eye moderate, large. Mouth cleft wide. Maxillary extends below hind part of eye or beyond, dilated behind and with 2 supplemental maxillary. Teeth small, conic, in narrow bands in jaws, on vomer, palatines, pterygoids and tongue. Gill openings very wide. Pseudobranchiae well developed. Branchiostegals 10 to 16. Pyloric appendages 5 or 6. Orbitosphenoids well developed or no ossification in front of interorbital region (Hime). Scales large. Lateral line complete, axial. Dorsal advanced or inserted nearly opposite ventral, often with long pointed lobe in male. Adipose fin small. Anal moderate. Caudal forked. Pectoral rather long.

Analysis of species

a[1]. Aulopus. Gill rakers 6 to 8 - 12 to 14; scales 50 to 52 in lateral line to caudal base and 3 more on latter.

b[1]. Dorsal II, 12 to 14; Anal II, 9. filamentosus.

b[2]. Dorsal II, 20; Anal I, 12. purpurissatus.

a[2]. Hime. Gill rakers 8 to 9 - 14 to 16; scales 42 or 43 in lateral line to caudal base; Dorsal I, 15; Anal II, 8. japonicus.

Aulopus filamentosus (Bloch)

Salmo filamentosus BLOCH, Schrift. Ges. Naturgorsch. Freund. Berlin, vol. 10, 1791, p. 424, pl. 9, fig. 2.

Livorno, Italy.

Aulopus filamentosus SWAINSON, Nat. Hist. Animals, vol. 2, 1839, p. 288 (Sicily).-- BONAPARTE, Iconogr. Fauna Italica, Pesci 3, pt. 1, fasc. 28, 1840, pl. , figs. 1a - b (Italy); Cat. Met. Pesc. Europ., 1846, p. 38 (Mediterranean). -- VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 513 (Nice, Messina, Moree, Canaries). -- GUNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 402 (Mediterranean; Madeira). -- CANESTRINI, Fauna Italica, Pesci, 1874, p. 122 (Nice, Southern Italy, Naples, Sicily). -- MOREAU, Manuel Ichth. France, 1892, p. 561 (Mediterranean, Cette, Nice). -- GRIFFINI, Man. Ittoil. Italiana, 1903, p. 267, fig. 145. -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia 1911 (1912), p. 563 (Italy); 1923, p. 33 (Praia Formosa, Madeira).

Autopus filamentosus STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, Math.-naturw. Kl., vol. 57, pt. 1, 1868, p. 730 (Teneriffe; error).

Salmo tirus RAFINESQUE, Carr. Nuov. Piant. Animal. Sicil., 1810, p. 56. Sicily.

Osmerus saurus (not LINNAEUS) RISSO, Ichth. Nice, 1810, p. 325. Nice.

Saurus lacerta RISSO, Hist. Nat. Eur. Merid., vol. 3, 1826, p. 463. Nice. -- LOWE, Trans. Zool. Soc. London, vol. 11, 1843, p. 88 (Madeira).

Aulopus filifer VALENCIENNES, Hist. Nat. Canaries, Poiss., vol. 2, pt. 2, 1836-44, p. 73, pl. 15, fig. 2. Canary Islands. -- STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, Math.-naturw. Kl., vol. 51, pt. 1, 1865, p. 403 (Santa Cruz, Teneriffe).

Aulopus maculatus VALENCIENNES, Hist. Nat. Canaries, Poissp, vol. 2, pt. 2, 1836-44, p. 74, pl. 15, fig. 3. Canary Islands. -- STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, Math.-naturw. Kl., vol. 51, pt. 1, 1865, p. 403 (Santa Cruz, Teneriffe).

Depth 5 to 7 4/5; head 3 to 3 1/2, width 1 9/10 to 2. Snout 3 1/3 to 3 2/3 in head from snout tip; eye 3 7/8 to 4 2/5, subequal with snout, greater than interorbital; premaxillary not quite reaching opposite hind eye edge, length 1 7/8 to 2 in head; from snout tip; interorbital 5 to 6, slightly concave. Gill rakers 7 or 8 + 13 or 14, of which 5 above and 3 below rudiments; others firm, rather slender; gill filaments 2 1/2 in interorbital.

Scales 50 to 52 in lateral line to caudal base and 3 more on latter; 5 above, 5 below, 15 predorsal, 3 rows on cheek. Caudal scaly basally.

D. II, 12, I to II, 14, I, second simple ray 1 3/4 to 1 4/5 in total head length; adipose fin to ; A. II, 9, I, second simple ray 3 1/4 to 3 2/5; caudal , forked; least depth of caudal peduncle 5 to 5 1/5; pectoral 1 7/8 to 2; ventral 1 1/2 to 1 3/5.

Dull or pale brown, little paler below. Dorsal dusky terminally. Fins all pale.

Mediterranean, Canaries, Madeira. Several of specimens are males and show longer dorsal rays anteriorly, though none prolonged so much as represented in Bonaparte's figure.

to A. N. S. P. Italy. C. L. Bonaparte.

Dr. T. B. Wilson. Length to 327 mm.

A. N. S. P. Italy. C. L. Bonaparte. No. 20.

Dr. T. B. Wilson. Length mm. Dried skin.

A. N. S. P. Italy. C. L. Bonaparte. No. 23.

Dr. T. B. Wilson. Length mm. Dried skin.

Aulopus purpurissatus Richardson

Aulopus purpurissatus RICHARDSON, Icones Piscium, 1843, p. 6, pl. 2, fig. 3. Houtmans Abrolhos (Emery). -- MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, 1881, p. 221 (Port Jackson; Melbourne). -- MC COY, Prodromus Zool. Victoria, Dec. 6, 1881, pl. 54-55. -- LUCAS, Proc. Royal. Soc. Victoria, series 2, 1890, p. 35 (reference). -- OGILBY, Edible Fishes New South Wales, 1893, p. 166, pl. 40. -- WAITE, Mem. Australian Mus., vol. 4, 1899, p. 54 (New South Wales, 23 to 68 fathoms); Records Australian Mus., vol. 6, pt. 2, 1905, p. 59 (Mandurah). -- STEAD, Edible Fishes New South Wales, 1908, p. 33, pl. 11. -- OGILBY, Proc. Royal Soc. Queensland, vol. 21, 1908, p. (off Moreton Bay, Laguna Bay, Townsville, Mount Tempest, Queensland). -- MC CULLOCH, Zool. Res. Endeavour, vol. 1, pt. 1, Dec. 22, 1911, p. 22 (off Cape Wiles, South Australia, 75 fathoms).

-- ROUGHLEY, Fishes of Australia, 1916, p. 25, pl. 3 (New South Wales, Victoria, West Australia). -- WAITE, Records South Austral. Mus., vol. 2, No. 1, 1921, p. 44, fig. 64. -- MC CULLOCH, Fishes New South Wal es, ed. 2, 1927, p. 20, pl. 6, fig. 64a.

Aulopus purpurisatus KLUNZINGER, Archiv Naturges., vol. 38, pt. 1, 1872, p. 42 (Murray River). --

Aulopus milesii VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 385. " New Holland " (Miles) (= Sydney.).

Depth 4 3/5; head 3 1/4, width 2. Snout 3 1/8 in head from snout tip; eye 5 1/5, 1 3/5 in snout, 1 1/4 in interorbital; premaxillary reaches opposite hind eye edge, expansion 1 1/3 in eye, length 2 in head from snout tip, interorbital 4 1/5, low, deeply concave. Gill rakers 6 + 12, of which 3 or 4 above and below rudiments, others lanceolate, subequal with gill filaments or 1 3/4 in head.

Scales 50 in lateral line to caudal base; 6 above, 6 below, 14 predorsal, 4 rows on cheek. Caudal largely covered with fine scales. Scales with 145 fine basal circuli, not extended apically; 40 strong triangular apical points.

D. I, 20, first branched ray 1 5/6 in total head length; adipose fin 6 3/4; A. I, 12, I, first branched ray 3; least depth of caudal peduncle 4 1/2; caudal 1 1/2, well forked, lobes pointed; pectoral 1 2/3; ventral 1 1/8.

Back dark umber brown, obscurely mottled with darker. Under surfaces of head and body paler brownish, with more or less soiled appearance. Iris pale brownish. Fins all brownish, all with very obscure darker transverse spots on rays of dorsal, form more or less as cross bands on other fins.

47802. U. S. N. M. Port Jackson. Australian Museum. Length 310 mm.

Aulopus japonicus Günther

Aulopus japonicus GÜNTHER, Rep. Voy. Challenger, vol. 1, pt. 6, 1880, p. 72. Market of Yokohama. -- FRANZ, Abh. Kön. Bayer. Akad. Wiss., vol. 4, Suppl. Band 1, 1910, p. 21 (Yokohama and Sagami Bays).

Depth 4 2/5 to 4 3/4; head 2 9/10 to 3 1/3, width 1 7/8 to 2. Snout 3 3/5 to 3 4/5 in head from snout tip; eye 3 1/5 to 3 3/4, greater than snout in young to subequal in male, greater than bony interorbital; premaxillary reaches 1/2 to 3/5 in eye, expansion 1 4/5 to 2 in eye, length 2 to 2 1/5 in head from snout tip; interorbital 4 1/4 to 5, low, concave. Gill rakers 8 or 9 + 14 to 16, lanceolate, equal gill filaments or 2 1/3 in eye.

Scales 42 or 43 in lateral line to caudal base; 5 above, 4 below, 10 or 11 predorsal, 3 rows on cheek. Caudal largely covered with fine scales. Scales with 89 or 90 basal radiating circuli, not extended apically; 46 rather strong triangular apical points.

D. I, 15, I, second branched ray 1 3/5 to 1 3/4 in tota head length first branched ray in male long as head; aidpose fin 6 to 7 1/2; A. II, 8, I, first branched ray 2 2/5 to 3 7/8; caudal 1 2/5 to 1 3/4, widely expanded or but slightly notched; least depth of caudal peduncle 4 1/5 to 4 2/5; pectoral 1 2/5 to 1 1/2; ventral 1 to 1 1/3.

Brownish above, paler to whitish below. Three large dark saddle like blotches on back, each saddle made up of variable or obscure darker borders; first saddle at front of dorsal, second at hind part of dorsal and third at adipose fin; usually some scattered brown spots in pale intervals. Iris silvery white with some gray tints. Fins all pale brownish.

10069. D. 5279. Malavatuan Island (W.), S. 18° W., 5.40 miles (N. 13° 57° 30" E. 120° 22' 15"), China Sea, vicinity Southern Luzon. In 117 fathoms. July 17, 1908. Length 243 mm. Male.

51422 U. S. N. M. Suruga Bay, Japan. Albatross Station 3708. Length 212 mm.

51439 U. S. N. M. Suruga Bay, Japan. Albatross Station 3730. Length 117 mm.

57561 U. S. N. M. Yokohama, Japan. P. L. Jouy. Length 185 mm.

Genus Scopelosaurus Bleeker

Scopelosaurus BLEEKER, Act. Soc. Sci. Ind. Neerland., (Amboina), vol. 8, 1860, p. 12. Type Scopelosaurus hoedti BLEEKER, monotypic.

Body elongate, cylindrical, slender, depth 11 or more. Head small. Snout long, pointed. Eye large, anterior. Mouth large, bordered above by premaxillaries, long maxillary above. Teeth fixed, small, uniserial in premaxillaryes, on palatines and vomer, several series in mandible, none on tongue. Opercular bones reduced. Gill rakers rather long and slender. Gills 4. Pseudobranchiae present. Branchiostegals 9. Scales cycloid, small, absent from head. **Lateral line** straight, with over 60 scales, formed of tubules. Three ventral series of photophores between isthmus and anal. Dorsal origin little nearer caudal base than snout tip, higher than base length or slightly higher than body. Adipose fin slender, oblong, pointed, **opposite last anal rays. Anal subequal with** post-ocular, longer than high, emarginate. Caudal forked. Pectoral median, lateral, pointed. Ventral much shorter than pectoral, nearer head than anal.

Scopelosaurus hoedti Bleeker

Scopelosaurus hoedti BLEEKER, Act. Soc. Sci. Ind. Neérland., (Amboina), vol. 8, 1860, p. 13. Amboina. -- GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 417 (copied). -- BLEEKER, Atlas Ichth. Ind. Neérland., vol. 6, 1866-1872, p. 157, pl. (2) 278, fig. 4 (type). -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 176, fig. 68 (type).

Family SYNODONTIDAE

Body oblong or elongate, little compressed. Head moderate, pointed. Mouth very wide, entire upper margin formed by long slender premaxillaries, closely adherent with slender maxillaries, latter mostly rudimentary or obsolete and never expanded posteriorly. Teeth mostly cardiform in body jaws, on palatines and tongue. Canines rarely present and larger teeth usually depressible. No barbels. Opercle thin, complete. Gill membranes separate, free from isthmus. Gill rakers tuberbular, or obsolete. Pseudobranchiae present. Branchiostegals usually numerous. Body covered with cycloid scales, rarely naked. Lateral line present, axial. Skeleton rather well ossified. Air vessel small or wanting. Intestinal canal short. Eggs closed in sacs of ovary and extruded through oviduct. Dorsal fin short, of soft rays only. Adipose fin present, rarely obsolete. Anal moderate or long. Caudal forked. Paired fins present.

Mostly shore fishes, some living at great depths and most are not valued as food.

Analysis of genera

a[1]. Scales present, more or less adherent.

b[1]. Synodontinae. Premaxillary teeth simple, compressed, not barbed, in 1 or 2 rows; broad band of similar teeth on palate; mouth gape wide; flesh firm.

c[1]. Palatine teeth single band each side of palate.

d[1]. Snout very short, shorter than eye; anal longer than dorsal.

Trachinocephalus.

d[2]. Snout rather acute, longer than eye.

e[1]. Anal much longer than dorsal; no lateral line. Xystodus.

e[2]. Anal much shorter than dorsal; lateral line present. Synodus.

c[2]. Palatine teeth in 2 bands each side of palate; snout rather acute; anal shorter than dorsal. Saurida.

b[2]. Harpadontinae. Lower teeth of lower jaw barbed; longer teeth more or less depressible; anal moderate; flesh very soft. Harpadon.

b^3. Bathysaurinae. Premaxillary teeth in very broad band, curved, unequal, barbed at end; similar band on palatines; flesh delicate.

Bathysaurus.

a^2. Bathylacinae. Scales very caducous, or absent; teeth in narrow bands; vent postmedian.

Bathylaco.

Genus Trachinocephalus Gill

Trachinocephalus GILL, Proc. Acad. Nat. Sci. Philadelphia (Cat. East Coast Fishes), 1861, p. 53. Types Salmo myops SCHNEIDER, monotypic.

Laurida SWAINSON, Nat. Hist. Animals, vol. 2, 1839, p. 287. Type Salmo foetens (not LINNAEUS) BLOCH = Salmo myops SCHNEIDER, designated by SWAIN, Proc. Acad. Nat. Sci. Philadelphia, 1882, p. 279.

Goodella OGILBY, Proc. Linn. Soc, New South Wales, vol. 22, 1897, p. 249. Type Goodella hypozona OGILBY, monotypic.

Body elongate, compressed, robust. Head deep, laterally compressed. Snout very blunt, shorter than eye. Lower jaw protrudes. Teeth simple, slender, small, close set. Single band of teeth on each palatine. Branchiostegals 16. Scales moderate 55 to 58. Anal longer than dorsal. Vent premedian, below tip of last dorsal ray.

-- BLEEKER, Versl. Kon. Akad. Meded. Wet. Amsterdam, ser. 2, vol. 2, 1868, p. 306 (Aru Islands). -- SCHMELTZ, Cat. Mus. Godeffroy, No. 4, 1869, p. 24 (Viti Islands). -- DAY, Fishes of India, pt. 3, 1877, p. 503, pl. 117, fig. 5 (Madras). -- MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, 1881, p. 217 (Port Jackson). -- MEYER, Anal. Soc. Espan. Hist. Nat. Madrid, vol. 14, 1885, p. 41 (Manado, Celebes). -- VAILLANT, Bull. Soc. Philomath. Paris, ser. 7, vol. 11, 1886-87, p. 53 (Tahiti). -- ISHIKAWA and MATSUURA, Prelim. Cat. Fishes Mus. Tokyo, 1897, p. 22 (Bonin Islands). -- GILCHRIST and THOMPSON, Ann. South African Mus., vol. 6, 1908-11, p. 264 (St. Lucia Bay, 17 to 20 fathoms). -- GUNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, 1909, p. 375 (Fiji). -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 145 (Nias, Lombok, Ceram, Gebe), p. 149 (description of larva).

-- GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, 1917, p. 306 (reference). -- METZELAAR, Rapp. Kolonie Curacao, vol. 2, pt. 1, 1919, p. 214 (compiled).

Saurus (Trachinocephalus) myops METZELAAR, Rapp. Kolonie Curacoa, vol. 2, pt. 1, 1919, p. 23 (off St. Eustatuis, 10 fathoms).

Trachinocephalus myops GILL, Proc. Acad. Nat. Sci. Philadelphia (Cat. East Coast Fishes), 1861, p. 53 (reference). -- WAITE, Mem. Australian Mus., vol. 4, 1899, p. 53 (off Newcastle, in 16 to 19 fathoms). -- JENKINS, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 433 (Honolulu). -- WAITE, Rec. Australian Mus., vol. 5, pt. 3, 1904, p. 148 (Lord Howe Island). -- SNYDER, Bull. U. S. Fish Comm., vol. 22, 1902 (1904), p. 521 (Honolulu; Hamalei Bay; Kauai). --

JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 62, fig. 13 (Hilo; Honolulu). -- WAITE, Rec. Australian Mus., vol. 6, pt. 2, 1905, p. 58 (between Houtman's Abrolhos and West Australia). -- SEALE, Occas. Pap. Bishop Mus., vol. 4, No. 1, 1906, p. 5 (Shortland Island). -- EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 55 (Bulan). -- JORDAN and HERRE, Proc. U. S. Nat. Mus., vol. 32, 1907, p. 514 (Nagasaki, Tokio, Wakanoura, Hawaii, Jamaica, Brazil). -- JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, No. 4, 1909, p. 167 (Takao). -- FRANZ, Abh. Kön. Bayer. Akad. Wiss., vol. 4, Suppl. Band 1, 1910, p. 17 (Hakodate, Yokohama, Aburatsubo). -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911, p. 563 (Yokohama). -- IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., Vertebr., 1920, p. 180 (Tosa). --

FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 3 (Takao, Formosa). -- MEEK and HILDEBRAND, Field Mus. Nat. Hist. Publ. No. 215, Zool. Ser. vol. 15, pt. 1, Dec. 20, 1923, p. 222 (Massachusetts, Florida, Cuba, Hawaiian Islands, Japan, Philippines). -- FOWLER, Bull. Bishop Mus., No. 22, 1925, p. 23 (Honolulu). -- FOWLER and BALL, Bull. Bishop Mus., No. 26, 1925, p. 7 (Lahaina, Maui). -- WHITLEY, Rec. Australian Mus., vol. 15, No. 5, April 6, 1927, p. 290 (Port Hacking, Lord Howe Island, New Hebrides, Madras). -- MC CULLOCH, Fishes New South Wales, ed. 2, 1927, p. 20, pl. 6, fig. 66a. -- FOWLER, Mem. Bishop Mus., vol. 10, 1928, p. 64, pl. 3 C (Honolulu, Lahaina).

Synodus myops BLEEKER, Atlas Ichth. Ind. Neérland., vol. 6, 1866-72, p. 153, pl. 278, fig. 3 (Sumatra, Pinang, Banka, Bali, Celebes, Batjan, Amboyna, Ceram). -- JORDAN and GILBERT, Bull. U. S. Nat. Mus., No. 17, 1882, p. 281 (compiled). -- MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 131 (Havana). -- STEINDACHNER, Abh. Seckenberg. Ges., vol. 25, 1900, p. 449 (Ternate).

Synodus (Trachinocephalus) myops STEINDACHNER, Denks. Akad. Wiss. Wien, Math.-nat. Kl., vol. 71, pt. 1, 1907, p. 154 (Ras Shoab, Kalansiye, Gischin).

Salmo foetens (not LINNAEUS) BLOCH, Naturg. Aus. Fische, vol. 8, 1794, p. 118, pl. 384, fig. 2 (part).

Laurida foetans SWAINSON, Nat. Hist. Animals, vol. 2, 1839, p. 288 (on BLOCH).

Osmerus lemniscatus LACÉPÈDE, Hist. Nat. Poiss.,
vol. 5, 1803, p. 236. Martinique.

Saurus truncatus AGASSIZ, Pisc. Brasil. Spix, 1826,
p. 82, pl. 45. Brazil.

Laurida truncata SWAINSON, Nat. Hist. Animals, vol. 2,
1839, p. 288 (on AGASSIZ).

Saurus limbatus EYDOUX and SOULEYET, Voy. Bonite, Zool.,
vol. 1, 1841, p. 199, pl. 7, fig. 3. No locality.

Trachinocephalus limbatus SEALE, Occas. Pap. Bishop
Mus., vol. 1, No. 5, 1902, p. 17 (Honolulu). --
OGILBY, Commerc. Fish Fisher. Queensland, 1915,
p. 48 (Brisbane).

Saurus trachinus SCHLEGEL, Fauna Japonica, Poiss., pts. 10-14, 1846, p. 231, pl. 106, fig. 2. Nagasaki.. --

CANTOR, Journ. Asiatic Soc. Bengal, vol. 18, pt. 2, 1849, p. 1253 (Pinang).

Trachinocephalus trachinus JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1900, p. 350 (Tokyo); Annotat. Zool. Japon., vol. , 1901, p. 57 (Yokohama). -- JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, 1902, p. 329 (Keerun, Formosa).

Saurus fasciolatus (LE SUEUR) VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1848, p. 485 (name in text).

Saurus brevirostris POEY, Mem. Hist. Nat. Cuba, vol. 2, 1860, p. 385. Cuba.

Goodella hypozona OGILBY, Proc. Linn. Soc. New South Wales, vol. 22, pt. 2. June 30, 1897, p. 250. On the outer beaches (near Sydney, New South Wales).

Depth 5 1/4 to 5 1/2; head 3 2/5 to 5 1/2, width 1 7/8 to 2. Snout 6 1/2 to 6 3/4 in head; eye 6 1/4 to 7 4/5, 1 1/4 in snout, 1 1/3 in interorbital; adipose lids narrow, marginal; premaxillary extends 1 to 2 1/4 eye diameters behind eye, length 1 3/4 to 1 7/8 in head; interorbital 6 to 7 1/4, concave. Gill rakers clusters of minute numerous spinules, much less than gill filaments, which 1 3/4 in eye.

Scales 51 to 54 in lateral line to caudal base and 4 or 5 more on latter; 3 or 4 above, 6 or 7 below, 16 or 17 predorsal; 5 rows on postocular to hind preopercle ridge, 2 rows on opercle above. Ventral axillary scale 3 1/2 in fin. Scales with 3 to 5 basal radiating striae, edge scalloped; circuli very fine, not extended apically.

D. II, 11, I or II, 12, I, first branched ray 1 2/5 to 1 4/5 in head; adipose fin 6 7/8 to 7; A. 15, I, last ray 3 1/5 to 3 2/3; caudal 1 2/5 to 1 2/3, forked; least depth of caudal peduncle 3 4/5 to 4; pectoral 2 1/7 to 2 2/5; ventral 1 to 1 1/8.

Pale brown above, lighter below. Back and side with slightly waved to somewhat irregular longitudinal deep brown lines, usually following courses of scales and enclosing gray band about equal in width to interspace between succeeding band. Scapula with deep brownish. Nape and top of head irregularly mottled with deep brown lines, streaks and blotches. Iris pale brown. Fins very pale brownish.

6845. Kowloon market, China. October 20, 1908. Length 235 mm.

5833 U. S. N. M. Garden Key, Florida. Whitehurst. Length 175 mm.

16951 U. S. N. M. Wood's Holl, Mass. 1876. V. N. Edwards. Bureau of Fisheries. Length 58 mm.

21917 U. S. N. M. Wood's Holl, Mass. 1876. V. N. Edwards. Bureau of Fisheries. Length 127 mm.

33122 U. S. N. M. Cuba. Prof. F. Poey. Length 160 mm.

43320 U. S. N. M. Bahia, Brazil. Albatross Station . 1887. Length 140 to 150 mm.

44103 U. S. N. M. Wood's Holl, Mass. V. N. Edwards. Bureau of Fisheries. Length 79 mm.

Trachinocephalus myops (Schneider)

Salmo myops SCHNEIDER, Syst. Ichth. Bloch, 1801, p. 421. St. Helena. (On FORSTER.)

Saurus myops CUVIER, Regne Animal, ed. 2, vol. 2, 1829, p. 268 (copied). -- VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 485 (South Carolina, Martinique, Bahia, Brazil, Saint Helena, Maurituis, Ponditherry, Trinquemale, Macao, Celebes, Amboina). -- CANTOR, Journ. Asiatic Soc. Bengal, vol. 18, pt. 2, 1849, p. 1423 (Pinang). -- BLEEKER, Verh. Batav. Genootsch. (Japan), vol. 26. 1851, p. 6 (Nagasaki); Act. Soc. Sci. Ind. Neerland., No. 3, vol. 3, 1857-58, p. 6 (Japan). -- GUICHENOT, Notes Ile Reunion, vol. 2, 1862, p. 29. -- GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 398 (Cuba, Jamaica, Japan, Amboina, Pinang, Mauritius, Port Jackson).

48826 U. S. N. M. Maroubra, New South Wales. J. D. Ogilby. Length 22 to 46 mm. As Goodella hypozona.

49483 U. S. N. M. Tokyo, Japan. Albatross Station. Length 140 mm.

51035 U. S. N. M. Bureau of Fisheries 10798. Length 182 mm.

55271 U. S. N. M. Albatross Collection. Length 62 to 133 mm. 5 examples.

55372 U. S. N. M. Honolulu. Albatross Collection 1902. Length 140 mm.

56218 U. S. N. M. Philippines. Bureau of Fisheries 4129. Length 199 mm.

59775 U. S. N. M. Kochi, Japan. May 7, 1903. Dr. H. M. Smith. Length 118 mm.

62345 U. S. N. M. Wakanoura, Japan. D. S. Jordan and J. O. Snyder. Length 66 mm.

64644 U. S. N. M. Tokyo, Japan. K. Otaki. Length 193 mm.

71067 U. S. N. M. Otaru, Japan. Albatross Collection. Length 333 mm.

71102 U. S. N. M. Misaki, Japan. Albatross Collection 1906. Length 86 to 94 mm. 2 examples.

71468 U. S. N. M. Shimizu, Japan. Albatross Collection 1906. Length 77 to 112 mm. 2 examples.

71469 U. S. N. M. Kagoshima, Japan. Albatross Collection. Length 108 to 152 mm. 9 examples.

76631 U. S. N. M. Takao, Formosa. Dr. Fred Baker. Length 50 to 180 mm. 12 examples.

83783 U. S. N. M. Albatross Station 2725. Length 28 to 38 mm. 4 examples.

83784 U. S. N. M. St. Thomas, West Indies. Albatross Station. 1884. Length 90 mm.

83895 U. S. N. M. Albatross Station 2611. Length 133 mm.

88093 U. S. N. M. Tortugas, Florida. June-August 1926. Prof. W. H. Longley. Length 210 mm.

Genus Xystodus Ogilby

Xystodus OGILBY, Proc. Royal Soc. Queensland, vol. 23, Nov. 7, 1910, p. 5. Type Xystodus banfieldi OGILBY, monotypic.

Body depressed, slender, little wider than deep. Head moderate. Eye rather small, adipose lids vestigeal. Teeth in jaws unequal, uniserial, long compressed widely separated sagittate fangs and between each pair 1 or 2 much shorter obtusely pointed ones; palatine teeth similar, acicular, biserial, form long narrow band; 2 strong series on hyoid; multiserial patch anteriorly on tongue. Nostrils well separated, anterior circular and cirrigerous, posterior oblique slit below level of anterior. Frontal groove smooth in front, profusely pierced by small pores behind, continuous with occipital groove. Scales present. No lateral line. Dorsal origin midway between snout tip and caudal base. No adipose fin. Anal longer than dorsal, similar. Pectorals small, rounded. Ventrals with 8 rays. Vent much nearer ventral than anal.

One species.

Xystodus banfieldi Ogilby

Xystodus banfields OGILBY, Proc. Royal Soc. Queensland, vol. 23, Nov. 7, 1910, p. 6. Near Dunk Island, Queensland.

Depth 7 1/5; head 3 3/5. Snout 4 1/4 in head; eye 6 4/5, 1 3/5 in snout; mouth cleft 1 3/5; interorbital 1 1/4 in eye, concave.

Scales 51 in lateral series; 13 transversely.

D. 11, nearly high as long, height 1 9/10 in head; A. 14, thrice long as high, 1/4 longer than dorsal; middle caudal rays 2 1/2 in upper lobe; caudal peduncle deep as wide, without keel; pectoral rays 13, reaches ventral base, length 2 1/4 in head; ventral 1 1/10, not reaching vent.

Lilac, each scale of back with dark median stripe, often forked terminally and form together 9 narrow longitudinal pencillings. Purplish lateral band about half scale wide from upper part of opercle to caudal base, dividing lilac of back from yellowish white of lower half of body; anteriorly, to above pectoral, band black and from lower edge gives off 12 short subcruciform bars to encroach on lighter color below; these bars much larger and darker in front and gradually fade away behind. Head spotted with violet and with transverse dark edged bands between eyes and 3 similar bands directed forward and downward from eye to and upon premaxillary. Base and middle rays of caudal and base of pectoral yellow. Length 142 mm. (Ogilby).

Queensland.

Genus Synodus Grownow

Synodus GRONOW, Mus. Ichth., vol.2, 1763, No. 151.

Species nonbinomial. (Type Esox synodus LINNAEUS).

-- SCOPOLI, Introd. Hist. Nat., 1777, p. 449. Type Esox synodus LINNEAUS.

Tirus RAFINESQUE, Carr. Nuov. Animal. Piant. Sicil., 1810, p. 56. Type Tirus marmoratus RAFINESQUE, monotypic.

Saurus CUVIER, Regne Animal, vol. 2, 1817, p. 169. Type Salmo saurus LINNAEUS, tautotypic.

Alpismaris RISSO, Hist. Nat. Eur. Mer., vol. 3, 1826, p. 458. Type Alpismaris risso RISSO.

Body elongate, more or less depressed, or compressed. Head depressed. Snout triangular, pointed. Eye moderate, greatly advanced. Jaws subequal. Premaxillaries not protractile, very long, strong, more than half of head. Maxillary closely connected with premaxillary and very small or obsolete. Teeth in jaws in 1 to 2 series, large, compressed, knife like, inner and larger depressible. Palatine teeth similar, smaller, in single broad band each side of palate. Patch of strong depressible teeth on front of tongue. Gill membranes slightly connected. Gill rakers very minute spinules. Pseudobranchiae well developed. Branchiostegals 12 to 16. Stomach with long blind sac and many pyloric coeca. Supraorbital projected little above eye. Scales cycloid, moderate, adherent. Lateral line axial. Dorsal short, premedian. Anal short. Caudal narrow, forked. Pectoral moderate, inserted high. Ventral anterior, not far behind pectoral, large, inner rays longer, rays 8. Vent postmedian.

The following postlarval likely this genus not identifiable:

83783 U. S. N. M. Albatross Station 2725. Length 30 to 40 mm. 4 examples.

Analysis of species

a[1]. Scales larger, 43 to 52; lateral line usually with blunt posterior keels.

b[1]. Anal longer than dorsal, with 15 rays.

sageneus.

b[2]. Anal about long as dorsal, with 10 to 12 rays.

c[1]. Front dorsal rays reach to or beyond foll-owing rays when depressed; lower jaws ends in fleshy point or knob; no black blotch on shoulder girdle; dorsal and caudal without bars.

d[1]. Pectoral short, reaches slightly beyond ventral base, 2 to 2 1/5 in head; ven-tral long, only slightly less than head, reach more than 1/2 to anal ori-gin; gill covers with pale lining.

e[1]. Eye 4 1/5 to 4 3/4; dorsal fin uni-form.

poeyi.

e[2]. Eye 4; dorsal fin barred with darker.

dominicensis.

d^2. Pectoral long, reaches past ventral base to about middle of ventral, 1 2/5 to 1 3/4 in head; ventral short, little less than postorbital, not reaching over 1/2 to anal origin; gill covers with dark lining. evermanni.

c^2. Front dorsal rays not reaching tips of following rays when depressed; lower jaw with obtuse tip; black blotch just back of upper front angle of opercle on shoulder girdle; dorsal and caudal with dark bars; gill covers with dark lining. intermedius.

a^2. Scales smaller 58 to 70 in lateral line; lateral line without keel.

f^1. Anal rays 8 to 10.

g^1. Mouth cleft extends little beyond eye. simulans.

g^2. Mouth cleft well extended beyond eye.

h^1. Scales 4 (3 1/2) above lateral line.

i^1. Dorsal 11; Anal 10; snout slightly longer than wide. kaianus.

12. Dorsal 13; Anal 8 or 9.

j1. Head 3 2/5.

k1. Snout wide as long; dorsal and caudal spotted; gill mem-branes uniform. indicus.

k2. Snout broader than long; dorsal and caudal uniform; upper parts of gill membranes with dark blotch-es. similis.

j2. Head 3 3/5 to 3 7/8 (3 in young). nicholsi.

h2. Scales 5 (4 1/2) above lateral line.

l1. Scales 58 to 61 in lateral line.

m1. Indo Pacific species.

n^1. Eye little wider than interorbital and scarcely more than half long as snout; body marking indefinite, fins uniform. houlti.

n^2. Eye much wider than interorbital and more than half long as snout; body with distinct dark cross bars; fins with brown spots. japonicus.

m^2. Atlantic species. synodus.

l^2. Scales 68 to lateral line. lacertinus.

f^2. Anal rays 11.

o^1. Snout not broader than long; more than 10 scales in cross count from dorsal to ventral lower jaw shorter.

p^1. Four rows of scales between lateral line and adipose fin; cheeks with 4 to 7 rows of scales.

q^1. Cheek with 6 or 7 rows of scales; eye 4 1/2 to 7 1/2; scales 56 to 64.

r^1. Anal usually 11.

foetens.

r^2. Anal usually 13.

scituliceps.

q^2. Cheek with 4 rows of scales; eye 4; scales 55.

acutus.

p^2. Six rows of scales between lateral line and adipose fin; cheeks with 9 rows of scales.

lucioceps.

o^2. Snout very wide, broader than long; 10 scales in cross count from dorsal to ventral; jaws subequal.

s^1. Dorsal scarcely higher than long. saurus.

s^2. Dorsal consider-ably high-er than long. altipinnis.

Synodus sageneus Waite

Synodus sageneus WAITE, Rec. Australian Mus., vol. 6, pt. 2, Sept. 15, 1905, p. 58, pl. 8, fig. 1. Between Freemantle and Houtman's Abrolhos, Western Australia.

Depth 7 2/3; head 3 2/3. Snout 4 7/8 in head; eye 7 1/10, 1 1/2 in snout; 1 in interorbital; maxillary extends 2 eye diameters behind eye, length 1 2/3 in head; interorbital low, orbit cutting in profile.

Scales 52 in lateral line; 4 above, 4 below, 7 rows on cheek.

D. II, 10, first branches ray 1 7/8 in head; adipose fin?; A. 15, third ray 4; caudal 1 2/5, deeply forked; least depth of caudal peduncle 4 7/8; pectoral 2 2/5, 1 7/8 in postocular; ventral 1 1/10 in head.

Yellow above, silvery beneath. All scales broadly margined with yellowish brown, especially on lower surface. Length 265 mm. (Waite.)

Western Australia.

Synodus poeyi Jordan

Synodus poeyi JORDAN, Proc. U. S. Nat. Mus., vol. 9, 1886, p. 526. Havana. -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 536 (compiled). -- MEEK and HILDEBRAND, Field Mus. Nat. Hist. Publ. No. 215, Zool. Ser. vol. 15, pt. 1, Dec. 20, 1923, p. 218 (Fox Bay, Colon, Porto Bello).

Synodus intermeduis (not AGASSIZ) POEY, Enumeratio Pisc. Cuba, 1875, p. 143 (part). -- MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 132 (Havana).

Depth 6 to 8 2/5; head 3 1/4 to 3 2/3, width 1 9/10 to 2 1/4. Snout 3 2/3 to 4 in head from snout tip; eye 4 1/5 to 4 3/4, 1 to 1 1/8 in snout, greatly exceeds interorbital; premaxillary extends 1/2 to 3/4 eye diameters behind eye, length 1 2/3 to 1 4/5 in head from snout tip; interorbital 4 1/2 to 5, concave. Gill rakers as minute numerous spinules; gill filaments 1 1/2 in eye.

Scales 41 or 42 in lateral line to caudal base and 3 more on latter; 4 above, 5 below, 12 or 13 predorsal, 4 rows on postocular to hind preopercle ridge. Scales with 3 basal radiating striae; circuli fine, not extended apically.

D. II, 9, I or II, 10, I, first branched ray 1 1/3 to 1 1/2 in total head length; aidpose fin 5 2/5 to 5 1/2; A. I, 8, I, first branched ray 2 3/4 to 2 4/5; caudal 1 2/5 to 1 1/2, deeply forked; least depth of caudal peduncle 3 1/2 to 4; pectoral 2 to 2 1/8; ventral 1 1/6 to 1 1/5.

Back brown, mottled with darker. Four dusky transverse rather narrow bands on back. Along lateral line 8 dark blotches, below and in each interspace smaller dark spot, also dark spot may join or oppose larger dark blotches of lateral line. No dark blotch on shoulder girdle. Iris silvery. Dorsal and caudal grayish. Paired fins and anal whitish.

Caribbean Sea.

79619 U. S. N. M. Fox Bay, Colon, Panama. January 22, 1912. S. E. Meek and S. F. Hildebrand. Length 82 to 88 mm. 5 examples.

79632 U. S. N. M. Porto Bello, Panama. March 19, 1912. S. E. Meek and S. F. Hildebrand. Length 50 to 64 mm. 3 examples.

Synodus dominicensis Fowler

Synodus dominicensis FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911 (1912), p. 564, fig. 2. Santo Domingo; Copeia, No. 24, Nov. 19, 1915, p. 50 (type).

Depth 6 1/4; head 3 2/3, width 2 1/5. Snout 3 3/4 in head from snout tip; eye 4, 1 1/5 in snout, greater than interorbital; premaxillary reaches 1/3 of eye diameter behind eye, 1 length 1 2/3 in head from premaxillary tip; interorbital 4 3/4, slightly concave. Gill rakers minutely spinescent, numerous; gill filaments 1/3 of eye.

Scales 43 in lateral line to caudal base and 6 more on latter; 4 above, 6 below, 14 predorsal, 4 rows on postocular.

D. II, 9, I, first branched ray 1 2/5 in total head length; adipose fin 6 1/2; A. 10, I, third ray 2 3/4; caudal 1 3/5, forked; least depth of caudal peduncle 4 1/5; pectoral 2 1/6; ventral 1 2/5.

Dull brownish, paler below. Back with traces of fine and slightly darker mottlings made up of small spots and lines. Head brownish above, paler below. Scapular arch above with several faded small dark brown spots. Each dorsal ray with 5 deep brown spots, reat of fin pale. Caudal pale, except about 3 diffuse brownish shades over each lobe along inner edge. Other fins all pale, unicolor. Iris coppery.

Santo Domingo.

15883 A. N. S. P. Santo Domingo, West Indies. William M. Gabb. Length 76 mm. Type.

Synodus evermanni Jordan and Bollman

Synodus evermanni JORDAN and BOLLMAN, Proc. U. S. Nat. Mus., vol. 12, 1889, p. 152. N. 8° 6' 30" W. 78° 51', N. 7° 57' W. 78° 55'; Pacific Ocean off Colombia. -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 535 (compiled). -- GILBERT and STARKS, Mem. California Acad. Sci., vol. 4, 1904, p. 49 (Panama Bay). -- MEEK and HILDEBRAND, Field Mus. Nat. Hist. Publ. No. 215, Zool. Ser. vol. 15, pt. 1, Dec. 20, 1923, p. 219 (Chame Point).

Snout 5 2/3 to 7 1/4; head 3 to 3 2/5, width 2 1/8 to 2 1/5. Snout 4 to 4 1/8 in head; eye 4 to 5, 1 to 1 1/6 in snout, greater than interorbital in young to subequal with age; adipose eyelids marginal, very narrow; premaxillary reaches half eye diameter behind eye, length 1 3/4 to 1 5/6 in head; interorbital 4 to 4 1/4, concave. Gill rakers numerous, fine, minute spinules; gill filaments 1 2/5 in eye.

Scales 52 or 53 in lateral line to caudal base and 3 more on latter; 5 above, 6 below, 16 predorsal, 4 postocular rows to preopercle ridge. Pectoral axillary scale 1/4 of fin, ventral axillary scale 1/3 of fin. Scales with 3 basal radiating striae, edge scalloped; circuli very fine, not extending apically.

D. II, 9, I, first branched ray 1 2/5 to 1 5/6 in total head length; adipose fin 5 3/4 to 6; A. III, 8, I, first branched ray 2 2/3 to 3 2/5; caudal 1 3/5 to 1 3/4?, well forked; least depth of caudal peduncle 5 to 6; pectoral 1 1/2 to 1 3/4; ventral 1 3/5 to 1 4/5.

Back brown, mottled with paler, lower and under surfaces whitish. Along lateral line 8 to 10 dark brown blotches, each usually giving off small dark spot below and alternate one in each interspace, also below. Iris silvery white. Opercle clouded darker. Dorsal and pectoral brownish. Adipose fin brown, with pale edge. Other fins paler.

Off Colombia.

41144 U. S. N. M. N. 57° W. 78° 55', Galapagos Island. Albatross Station . Length 140 to 195 mm. 12 examples. Types.

41398 U. S. N. M. Albatross Station 2797. Length 134 mm.

41424 U. S. N. M. N. 70° 56' W. 79° 41'. Albatross Station . Length 215? mm.

46466 U. S. N. M. Albatross Station 3044. Length 128 to 147 mm. 4 examples.

46482 U. S. N. M. Albatross Station 3038. Length 100 to 137 mm. 3 examples.

46484 U. S. N. M. Albatross Station 2830. Length 203 to 228 mm. 2 examples.

46585 U. S. N. M. Albatross Station 3012. Length 108 mm.

54620 U. S. N. M. Albatross Station 2830. Length 225? mm.

61517 U. S. N. M. Albatross Station 3043. Length 125 mm.

81969 U. S. N. M. Chame Point, Panama. March 8 to 14, 1913. Robert Tweedlie. Length 40 mm.

Synodus intermedius (Agassiz)

Saurus intermedius AGASSIZ, Pisc. Brasil., Spix, 1829, p. 81, pl. 44. Brazil. -- GUNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 396 (Jamiaca, Demerara, South America); Rep. Voy. Challenger, vol. 1, pt. 6, 1880, p. 50 (Arafura Sea). -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 146 (West Indian specimen). -- METZELAAR, Repp. Kolonie Curacoa, vol. 2, pt., 1919, p. 214 (compiled).

Saurus (Synodus) intermedius METZELAAR, Repp. Kolonie Curacoa, vol. 2, pt. 1, 1919, p. 21 (Curacoa).

Laurida intermedia SWAINSON, Nat. Hist. Animals, vol. 2, 1839, p. 288 (on AGASSIZ).

Synodus intermedius POEY, Syn. Pisc. Cuba, 1868, p. 414 (Cuba); Enumeratio Pisc. Cub., 1875, p. 143 (Cuba). -- JORDAN and GILBERT, Bull. U. S. Nat. Mus., No. 16, 1882, p. 889 (compiled). -- MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 132 (part). -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 535 (compiled). -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911 (1912), p. 564, (St. Croix); -- MEEK and HILDEBRAND, Field Mus. Nat. Hist. Publ. No. 215, Zool. Ser. vol. 15, pt. 1, Dec. 20, 1923, p. 217 (Florida, Bermuda, Cuba). -- FOWLER, Mem. Bishop Mus., vol. 10, 1928, p. 64 (compiled).

Saurus anolis VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 483. Guadeloupe, Bahia, Martinique.

Synodus anolis MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 133 (type; Key West).

Synodus cubanus POEY, Enumeratio Pisc. Cub., 1875, p. 143. Cuba.

Depth 6 to 10 1/2; head 2 2/5 to 4, width 2 to 2 1/4. Snout 3 1/5 to 4 in head from snout tip; eye 3 3/5 to 8, 1 7/8 to 2 1/5 in snout, greater than snout in young, greater than interorbital in young to 1 3/5 in interorbital with age; premaxillary extends back 1/4 to 2 eye diameters behind eye, length 1 2/3 to 1 3/4 in head from snout tip; interorbital 4 1/10 to 4 3/4, rather evenly concave. Gill rakers minute villiform denticles; gill filaments equal eye.

Scales 47 to 49 in lateral line to caudal base and 4 more on latter; 4 or 5 above, 6 or 7 above, 18 to 23 predorsal, 7 rows on postocular. Axillary ventral scale 3 to 3 1/4 in fin. Scales with 3 basal radiating striae, edge scalloped; circuli very fine, not extending apically.

D. II, 9, I to II, 11, I, first branched ray 1 4/5 to 1 9/10 in total head length; adipose fin 7 3/4; A. II, 9, I, 11, first branched ray 3; caudal 1 2/5 to 1 2/3, forked; least depth of caudal peduncle 4 1/5 to 5 1/5; pectoral 2 1/8 to 2 1/3; ventral 1 1/5 to 1 1/3.

Brown above, with 9 dark transverse band like blotches along sides and slightly narrower ones alternating in intervals. On sides below lateral line and lower surfaces mostly each row of scales with slightly paler or very pale yellowish blotch, 2 lowest rows of sides continuous and other 2 distinct crossing dark blotches. Some dark clouding on lower sides of head, also under surfaces of same. Dorsal and caudal with rather obscure dark transverse bands or series of blotches. Other fins uniformly pale or brownish.

West Indies, Caribbean Sea, Brazil, East Indies.

9829 U. S. N. M. Cuba. Prof. F. Poey. Length 324 mm.

21383 U. S. N. M. Bermuda. Length 275 to 287 mm. 2 examples.

21890 U. S. N. M. Bermuda. Dr. G. B. Goode. Length 383 to 419 mm. 2 examples.

23814 U. S. N. M. Bermuda. Dr. G. B. Goode. Length 424 mm.

30715 U. S. N. M. Key West, Florida. William Stimpson. Length 280 mm.

31383 U. S. N. M. Bermuda. Dr. G. B. Goode. Length 283 to 290 mm. 3 examples.

31914 U. S. N. M. Pensacola, Florida. Silas Stearns. Length 235 mm. Poor.

32623 U. S. N. M. Florida. Length 273.mm.

32803 U. S. N. M. Pensacola, Florida. Silas Stearns. Length 77 to 183 mm. 2 examples.

35045 U. S. N. M. Key West, Florida. Length 320 mm.

35183 U. S. N. M. Havana Cuba. Dr. D. S. Jordan. Length 88 to 96 mm. 2 examples.

38711 U. S. N. M. Key West, Florida. Length 330 mm.

91818 U. S. N. M. British Honduras. Dr. R. O. Shufeldt. Length 35 mm.

92050 U. S. N. M. South of Tortugas. Prof. W. H. Longley. Length 260 mm.

1 example U. S. N. M. Albatross Station 2317. Length 295 mm. As Synodus anolis.

A. N. S. P. St. Croix, West Indies. Dr. R. E. Griffiths. Length 348 mm. Dried skin. Pale brown, paler below. Back mottled darker, formed by deep brown blotch at base of each scale. Ten obscure brownish blotches along side. Scapular arch above with large dusky blotch. Iris brown. Fins pale brown, each dorsal ray with 5 deeper diffuse brownish blotches and each caudal lobe with 6 transverse bars of same shade, narrower on upper and lower edges of fin and braodly expanding towards inner edges of lobes. Other fins apparently uniform.

Synodus simulans Garman

Synodus simulans GARMAN, Mem. Mus. Comp. Zool., vol. 24, 1899, p. 251, pl. 50, fig. 3. Off Cocos Islands.

Depth 7; head 4. Snout 4 1/3 in head; eye 5, greater than snout; premaxillary extends half an eye diameter behind eye, length 2 in head; very low interorbital with narrow groove.

Scales 62 in lateral line, 4 above, 4 below.

D. 12, second ray 2 1/5 in head; adipose fin 7 1/5; A. 9, second ray 6; caudal 1 2/5, emarginate behind, least depth of caudal peduncle 4 1/6; pectoral 2; 1 1/10 in postorbital; ventral 1 1/3.

Yellowish white, slight brownish cast on back. Seven pairs of narrow transverse brown streaks across back, first at front of dorsal base. Dark brown transverse streak at caudal base. Below and parallel with lateral line from below pectoral 11 horizontally oblong brown spots and last before anal fin, each larger than pupil and in posterior half contains round black spot nearly half as large. Fins light, caudal very little darker backward.

Length 54 mm. (Garman.)

Synodus kaianus (Günther)

Saurus kaianus GÜNTHER, Rep. Voy. Challenger, vol. 1, pt. 6, 1880, p. 50, pl. 23, fig. C. Ki Islands, in 129 fathoms; vol. 22, 1887, p. 180 (type).

Synodus kaianus GILBERT, Bull. U. S. Fish Comm., vol. 23, pt. 2, 1903 (1905), p. 588 (Pailolo Channel off northern Maui, in 122 to 178 fathoms). -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 148 (compiled). -- FOWLER, Mem. Bishop Mus., vol. 10, 1928, p. 65 (compiled).

Depth 5 4/5; head 3 2/5. Snout 3 1/3 in head; eye 5 1/5, 1 2/5 in snout; maxillary extends 3/4 eye diameter behind eye, length 1 3/5 in head; interorbital low, slightly concave, narrower than eye; frontal bones without sculpture.

Scales 63 in lateral line; 4 above, 6 below, 17 predorsal, 7 rows on cheek.

D. II, 10, first branched ray 2 2/5 in head; adipose fin 7; A. 10, fourth ray 4; caudal 1 1/2, well forked; least depth of caudal peduncle 4 1/2; pectoral 2, 1 1/8 in postocular; ventral 1 2/5 in head.

Upper parts greenish, lower silvery. Series of blackish spots alternately larger and smaller along middle of body. Length 140 mm. (Günther.)

Ki Islands and Hawaiian Group. Gilbert's material I have not seen.

Synodus indicus (Day)

Saurus indicus DAY, Journ. Linn. Soc. London, vol. 11, Zool., 1873, p. 526. Madras; Fishes of India, pt. 3, 1877, p. 503, pl. 117, fig. 4; Fauna Brit. India, vol. 1, 1889, p. 409.

Depth 6 1/2; head 3 2/5. Snout 4 in head; eye 5, 1 1/3 in snout; maxillary extends 1 2/5 in head; interorbital low, concave.

Scales 55 to 57 in lateral line; 4 above, 4 below, 17 predorsal, 5 rows on cheek.

D. 13, third simple ray 1 7/8 in head; adipose fin 1 1/2 in eye; A. 9, third ray 3; caudal 1 2/5, well forked; least depth of caudal peduncle 3 5/6; pectoral 2 3/5, 1 2/5 in postocular; ventral 1 1/3 in head.

Brownish in upper 2/3, dirty white beneath. Numerous bluish irregular spots or blotches along back and sides, in places almost form horizontal bands. Dorsal and caudal white, with grayish spots, forming irregular horizontal bands. Length 178 mm. (Day)

India.

Synodus similis Mc Culloch

Synodus similis MC CULLOCH, Mem. Queensland Mus., vol. 7, pt. 3, Nov. 4, 1921, p. 167, pl. 8, fig. 2.

Near the Capricorn Group, Queensland, in 25 to 30 fathoms.

Depth 7; head 3 2/5. Snout 4 1/3 in head; eye 5 7/8, 1 1/3 in snout, greater than interorbital; maxillary reaches 1 1/3 eye diameters beyond eye, length 1 3/4 in head; interorbital low, little concave.

Scales 58 in lateral line; 4 above, 4 below, 15 predorsal, 5 rows on cheek.

D. II, 11, I, first branched ray 1 2/3 in head; adipose fin 7; A. 9, I, third ray 3 1/8; caudal 1 1/2; least depth of caudal peduncle 5 1/5; pectoral 2 1/3, 1 1/2 in postocular; ventral 1 1/8 in head.

Grayish on back, sides and lower surfaces white. Ill defined gray markings form indefinite cross bars and about 8 imperfect rings on lateral line. Gray lines form narrow interrupted rows along each series of scales on upper half. Head with gray spots on opercles and gill membranes ornamented with 2 large black spots on each side above opercle. Fins without markings. Length 185 mm. from snout tip to end of middle caudal rays. (Mc Culloch.)

Queensland.

Synodus nicholsi Breeder

Synodus nicholsi BREEDER, Bull. Bingham Oceanogr. Collection, vol. 1, art. 1, Oct. 19, 1927, p. 13, fig. 6. Royal Island, Eleutheria, Bahamas.

Depth 6 to 7; head 3 3/5 to 3 7/8, width 1 4/5 to 2. Snout 4 3/5 to 4 2/3 in head; eye 4 1/2 to 6, 1 1/4 in snout, equals interorbital though greatly exceeds bony interorbital; premaxillary extends 1/2 to 1 1/5 eye diameters behind eye, length 1 3/4 to 1 4/5 in head; interorbital 4 1/2 to 6 1/5, concave. Gill rakers as numerous minute low spinules; gill filaments 1 2/5 in eye.

Scales 58 in lateral line to caudal base and 4 more on latter; 4 above, 6 below, 18 to 21 predorsal, 5 rows on post-ocular to hind preopercle ridge. Ventral axillary scale 2 1/2 in fin. Scales with 3 basal radiating striae, edge scalloped; circuli fine, not extended apically.

D. II, 9, I or II, 10, I, first branched ray 1 2/5 to 1 2/3 in head; adipose fin 5 to 6; A. I, 8, I, 9, I, longest front ray 3 to 3 1/3; caudal 1 1/3 to 1 2/5, well forked; least depth of caudal peduncle 4 to 4 1/6; pectoral 2 1/6 to 2 1/5; ventral 1 1/10.

Back pale brown, with transverse darker cross bands and each interval with narrower cross band. Under surfaces of head and body whitish. Iris whitish. Fins all more or less uniformly pale, lower ones whitish.

Bahamas. The specimens listed below seem to be the present species. The figure published by Breeder shows a larger head (2 9/10), lower jaw slightly protruding and little more advanced dorsal origin.

53078 U. S. N. M. Nassau. July 20, 1903. B. A. Bean. Length 71 mm. As Trachinocephalus myops.

53079 U. S. N. M. Clarence Harbor. July 15, 1903. B. A. Bean. Length 130 mm. As Trachinocephalus myops.

Synodus houlti Mc Culloch

Synodus houlti MC CULLOCH, Mem. Queensland Mus., vol. 7, pt. 3, Nov. 4, 1921, p. 165, pl. 8, fig. 1. Near the Capricorn Group, Queensland, in 25 to 30 fathoms.

Depth 6 1/8; head 3 1/4. Snout 4 1/10 in head; eye 8 1/8, 2 in snout; premaxillary extends 2 eye diameters behind eye, length 1 2/3 in head; interorbital very slightly less than eye, concave.

Scales 59 in lateral line; 5 above, 4 below, 16 predorsal, 5 or 6 rows on cheek.

D. II, 10, I, first branched ray 2 1/4 in head; adipose fin 7; A. 9, I, second ray 3 2/3; caudal 1 2/3, forked; least depth of caudal peduncle 6; pectoral 2 2/3, 2 1/10 in post-orbital; ventral 1 1/4 in head.

Grayish on back, sides and below white. Some very ill defined cross bars on back, most prominent at base of tail and some darker markings above lateral line. Head above with vermiculating gray lines, extend to lips near end of snout. Fins without markings. Length 203 mm. (Mc Culloch)

Queensland.

Synodus japonicus (Houttuyn)

Cobitis japonica HOUTTUYN, Verh. Holland. Maatsch. Wet. Haarlem, vol. 20, 1782, p. 450. Nagasaki.

Synodus japonicus JORDAN and HERRE, Proc. U. S. Nat. Mus., vol. 32, 1907, p. 516 (Wakanoura; Nagasaki). -- JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 237 (Cuyo). -- FRANZ, Abh. Kön. Bayer. Akad. Wiss., vol. 4, Suppl. Band 1, 1910, p. 18 (Yokohama). -- IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., Vertebr., 1920, p. 180 (Misaki). -- MC CULLOCH, Mem. Queensland Mus., vol. 7, pt. 3, 1921, p. 165 (Murray Island, Queensland; Lord Howe Island; Amboyna).

-- FOWLER, Copeia, No. 112, Nov. 20, 1922, p. 82 (Hawaii); Bull. Bishop Mus., No. 22, 1925, p. 4 (Guam), p. 23 (Honolulu); No. 26, 1925, p. 7 (French Frigates Shoal); Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 199 (Delagoa Bay); Bull Bishop Mus., No. 38, 1927, p. 7 (Pearl and Hermes Reef, Medway Island, Honolulu); Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 261 (Orion); Mem. Bishop Mus., vol. 10, 1928, p. 64, fig. 12 (Honolulu, Hilo, Laysan, French Frigates Shoal, Guam, Rarotonga, Fate, Mangareva, Shortland Islands, Society Islands, Ebon Islands, Fiji, types of Synodus dermatogenys).

Salmo varius LACÉPÈDE, Hist. Nat. Poiss., vol. 5, 1803, p. 224, pl. 3, fig. 3. Mauritius.

Saurus varius GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 395 ( ). -- SCHMELTZ, Cat. Mus. Godeffroy, No. 4, 1869, p. 24 (Samoa; Viti Islands). -- KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 589 (Red Sea). -- SCHMELTZ, Cat. Mus. Godeffroy, No. 5, 1874, p. 35 (Tahiti). -- MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, 1882, p. 592 (New Guinea). -- BOULENGER, Proc. Zool. Soc. London, 1887, p. 665 (Muscat). -- ISHIKAWA and MATSUURA, Prelim. Cat. Fishes Mus. Tokyo, 1897, p. 22. -- GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, 1909, p. 375 (Hawaii, Pelew, Fiji, Society, Paumotu, Samoa, Tahiti).

Synodus varius GÜNTHER, Rep. Voy. Challenger, vol. 1, pt. 6, 1880, p. 36 (Ovalau; Fiji). -- OGILBY, Mem. Australia Mus., vol. 2, 1889, p. 71 (Lord Howe Island). -- STEINDACHNER, Denks. Akad. Wiss. Wien, Math-nat. Kl., vol. 70, 1901, p. 513 (Honolulu, Laysan); Abh. Senckenberg. Ges., vol. 25, 1900, p. 450 (Ternate). -- JORDAN and SNYDER, Annotat. Zool Japan., 1901, p. 51 ( ). -- JENKINS, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 433 (Honolulu). -- SNYDER, Bull. U. S. Fish Comm., vol. 22, 1902 (1904), p. 521 (Honolulu). -- JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 28, 1904; p. 125 (Honolulu). -- JORDAN and EVERMANN, Bull. Bur. Fisher., vol. 23, pt. 1, 1903 (1905), p. 63, pl. 2, fig. 14 (Hilo; Honolulu).

-- GILBERT, Bull. U. S. Fish Comm., vol. 23, pt. 2, 1903 (1905), p. 588 (off Molokai, Avau Channel, Bird Island, 20 to 73 fathoms). -- SEALE, Occas. Pap. Bishop Mus., vol. 4, No. 1, 1906, p. 5 (Mangareva). -- JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 188 (Samoa). -- EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 55 (Bacon, Bulan, Philippines). -- REGAN, Ann. Durban. Mus., vol. 2, 1917-20, p. 76 (Natal).

Saurus variegatus QUOY and GAIMARD, Voy. Uranie, Zool., 1824, p. 223, pl. 48, fig. 3. Mauritius; Maui. -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 149, fig. 56 (description of larva).

Synodus variegatus SEALE, Occas. Pap. Bishop Mus., vol. 1, No. 3, 1900 (1901), p. 63 (Guam). -- BEAUFORT, Bijd. Dierk. Amsterdam, vol. 19, p. 101 (Saonek).

Saurus minutus LE SUEUR, Journ. Acad. Nat. Sci. Philadelphia, vol. 5, 1825, p. 118, pl. 5. Mauritius.

Laurida minuta SWAINSON, Nat. Hist. Animals, vol. 2, 1839, p. 288 (on LE SUEUR).

Synodus lucius SCHLEGEL, Fauna Japonica, Poiss., pts. 10-14, 1846, p. 232, pl. 106, fig. 1. Near Nagasaki. -- BLEEKER, Verh. Batav. Genootsch. (Japan), vol. 25, 1853, p. 19.

Saurus synodus (not LINNAEUS) VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 477 (part; New Guinea). -- THIOLLIERE, Fauna Woodlark, 1857, p. 204 (Woodlark Island). -- BLEEKER, Act. Soc. Sci. Ind. Neerland., No. 2, vol. 6, 1859, pp. 3, 5 (Doreh, New Guinea).

Saurus cynodus GUICHENOT, Notes Ile Reunion, vol. 2, 1862, p. 29 (error).

Synodus synodus BLEEKER, Atlas Ichth. Ind. Neêrland., vol. 6, 1866-72, p. 154, pl. (11) 278, fig. 5 (Java, Bali, Cocos, Sumatra, Batu, Nias, Singapore, Celebes, Sangi, Ternate, Halmaheira, Batjan, Amboina, Banda, Goram, New Guinea); Versl. Kon. Akad. Meded. Wet. Amsterdam, ser. 2, vol. 7, 1873, p. 36 (Aru Islands).

Saurus mormoririk (MONTROUZIER) THIOLLIERE, Fauna Woodlark, 1857, p. 204 (name in synonymy).

Saurus erythraeus KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 590. Koseir, Red Sea.

Synodus dermatogenys FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911 (1912), p. 566, fig. 3. Hawaiian Islands.

Depth 6 to 8; head 3 1/8 to 3 2/3, width 1 3/5 to 2 1/8. Snout 4 to 5 in head from upper jaw tip; eye 5 1/5 to 8 3/4, 1 1/4 to 2 in snout, 1 1/3 to 1 2/5 in interorbital; premaxillary reaches 1 1/2 to 1 3/5 eye diameters behind eye, length 1 1/2 to 1 3/5 in head from snout tip; interorbital 5 7/8 to 8 1/2, concave. Gill rakers numerous, minute, low spinules; gill filaments 1 4/5 to 2 in eye.

Scales 55 to 60 in lateral line to caudal base and 3 or 4 more on latter; 5 or 6 above, 6 or 7 below, 19 to 22 predorsal, 7 to 10 rows on postocular and hind portion for nearly half its area sometimes naked. Ventral axillary scale 3 1/2 in fin. Scales with 3 or 4 basal radiating striae, edges scalloped; circuli very fine, not extended apically.

D. III, 10, I or III, 11, I, first branched ray 2 to 2 2/5 in total head length; adipose fin 6 1/2 to 7; A. III, 6, I or III, 7, I, first branched ray 2 2/3 to 3 1/4; caudal 1 4/5 to 2, forked; least depth of caudal peduncle 6 1/5 to 6 1/4; pectoral 2 1/3 to 2 4/5; ventral 1 1/6 to 1 1/4.

Dusky olive above, below whitish. On back 7 dusky saddle like blotches with alternating paler ones. Head blotched with dusky and 2 dusky bands across jaws below. Iris neutral gray. Dorsal and caudal grayish, finely banded with dusky, other fins whitish.

Red Sea, Mauritius, Natal, East Indies, Philippines, Japan, Queensland, Micronesia, Melanesia, Polynesia, Hawaii.

51031 U. S. N. M. Hawaiian Island. Bureau of Fisheries 03817. Length 250? mm.

51706 U. S. N. M. Hawaiian Islands. Albatross Station 746. Length 77 mm.

52457 U. S. N. M. Apia, Samoa. Bureau of Fisheries. Length 122 mm.

52671 U. S. N. M. Bureau of Fisheries.03174. Length 208 mm.

54776 U. S. N. M. Kochi, Japan. May 7, 1903. Dr. H. M. Smith. Length 126 mm.

55272 U. S. N. M. Length 113 to 131 mm. 3 examples.

55376 U. S. N. M. Laysan. Albatross Station . Length 124 to 164 mm. 4 examples.

55425 U. S. N. M. Cocoanut Island, Hilo, Hawaiian Island. July 15, 1901. Bureau of Fisheries . Length 46 mm.

55437 U. S. N. M. Bureau of Fisheries. Length 209 to 225 mm. 3 examples.

56204 U. S. N. M. Bureau of Fisheries 3670. Length 182 mm.

58525 U. S. N. M. Length 363 mm.

59777 U. S. N. M. Suzume, Urado, Japan. May 10, 1903. Dr. H. M. Smith. Length 130 mm.

59778 U. S. N. M. Yamagawa, Japan. June 16, 1903. Dr. H. M. Smith. Length 88 mm.

59805 U. S. N. M. Kochi, Japan. Dr. H. M. Smith. Length 300 mm.

64661 U. S. N. M. Nagasaki, Japan. D. S. Jordan and J. O. Snyder. Length 235 to 255 mm. 3 examples.

74711 U. S. N. M. Nafa, Okinawa, Rui Kui. Albatross Station 1906. Length 161 to 183 mm. 3 examples.

89740 U. S. N. M. Black Beach Anchorage, Charles Island, Galapagos. Pinchot Expedition. June 27, 1929. Length 55 to 59 mm. 5 examples.

91826 U. S. N. M. Nukuhiva, Marquesas Islands. Sept. 25, 1929. Pinchot Expedition. Length 23 to 38 mm. 17 examples.

28130 A. N. S. P. Hawaiian Islands. Bureau of Fisheries. Length mm. Type of Synodus dermatogenys.

28131 to 28134 A. N. S. P. Hawaiian Islands. Bureau of Fisheries. Length 128 to 143 mm. Paratypes of Synodus dermatogenys.

A. N. S. P. Delagoa Bay, Portuguese East Africa. H. W. Bell Marley. Length 213 mm.

Synodus synodus (Linnaeus)

Esox synodus LINNAEUS, Syst. Nat., ed. 10, vol. 1, 1758, p. 313. America; ed. 12, vol. 1, 1766, p. 516.(copied). -- BONNATERRE, Tabl. Ichth., 1788, p. 174, pl. 72, fig. 295 (America). -- GMELIN, Syst. Nat. Linnaeus, vol. 1, 1789, p. 1390 (copied). -- WALBAUM, Artedi Pisc., vol. 3, 1792, p. 90 (compiled).

Synodus synodus MEUSCHEN, Mus. Gronovius, 1788, p. 35 (America). -- SCHNEIDER, Syst. Ichth. Bloch, 1801, p. 396 (America). -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 536 (compiled).

Saurus synodus VALENCIENNES, Hist. Nat. Poiss., 2, 1849, p. 477 (Martinique, Gradeloupe, Bahia, St. Helena). -- CLARK, Scottish Nat. Antarctic Exped., Rep. Sci. Res. "Scotia", vol. 4, Zool., pt. 16, June 30, 1913, p. 389, figs. 2-4 (St. Helena).

Saurus (Synodus) synodus METZELAAR, Repp. Kolonie Curacoa, vol. 2, pt. 1, 1919, p. 22 (Bonaire and St. Eustatuis).

Synodus gronovii WALBAUM, Artedi Posc., vol. 3, 1792, p. 655 (on Synodus GRONOW, Mus. Ichth., vol. 2, 1765, No. 155, pl. 7, fig. 1. America).

Synodus gronovianus SWAINSON, Nat. Hist. Animals, vol. 2, 1839, p. 286 (on GRONOW).

Synodus fasciatus LACÉPÈDE, Hist. Nat. Poiss., vol. 5, 1803, pp. 318, 321. North America.

Saurus atlanticus JOHNSON, Proc. Zool. Soc. London, 1863, p. 41. Madeira. -- GUNTHER, Cat. Fishes Brit. Mus., vol. 5, 1804, p. 395 (type; Madeira); Proc. Zool. Soc. London, 1869, p. 238 (Saint Helena). -- MELLISS, St. Helena, 1875, p. 110. -- METZELAAR, Rapp. Kolonie Curacoa, vol. 2, pt. 1, 1919, p. 214 (compiled).

Synodus varius (not LACÉPÈDE) GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 395 (part).

Synodus intermedius (not AGASSIZ) MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 132 (part).

Depth 4 2/5 to 5 3/5; head 3 1/2 to 3 4/5. Snout 4 to 4 1/3 in head; eye 5 4/5 to 6 3/5, 1 1/2 to 1 3/4 in snout; premaxillary extends about 1 1/2 to 1 2/3 eye diameters behind eye, length 1 2/5 to 1 1/2 in head; interorbital 7 1/2 to 8 1/2. Gill rakers reduced to rows of minute teeth.

Scales 60 to 62 in lateral line; 5 above.

D. 14 or 15, fin height 1 4/5 in head; adipose fin 6 to 7; A. 9 or 10, fin height 2 1/5 to 2 1/2; caudal 1 2/3 to 1 3/4, forked; least depth of caudal peduncle 4 to 4 1/3; pectoral 2; ventral 1 1/8 to 1 1/5.

Body and fins speckled dark gray or silvery gray background. Black spot on shoulder and snout tip. Several indistinct and irregular cross bars on body. Length 274 mm.

(Clark.)

Synodus lacertinus Gilbert

Synodus lacertinus GILBERT, Proc. U. S. Nat. Mus., vol. 13, 1890, p. 55. Acapulco, Mexico. -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 536 (compiled). -- MEEK and HILDEBRAND, Field Mus. Nat. Hist. Publ. No. 215, Zool. Series, vol. 15, Dec. 20, 1923, p. 220 (type; Acapulco).

Depth 5 1/3 to 7 1/4; head 3 3/4 to 3 7/8, width 1 4/5 to 1 7/8. Snout 4 1/4 to 4 3/4 in head; eye 5 4/5 to 7, 1 1/3 to 1 4/5 in snout, subequal with interorbital, bony interorbital 3/4 to 4/5 eye; premaxillary reaches 1 1/2 to 1 3/4 eye diameters behind eye, length 1 1/2 to 1 2/3 in head. Gill rakers as very minute numerous spinules; gill filaments 1 2/5 in eye.

Scales 59 to 61 in lateral line to caudal base and 3 or 4 more on latter; 5 above, 6 below, 19 or 20 predorsal, 6 on postocular to hind preopercle ridge. Pectoral axillary scale 2 2/3 in fin, ventral axillary scales 3 2/3 in fin. Scales with 4 basal radiating striae, edge scalloped; circuli very fine, not continued apically.

D. II, 10, I or II, 11, I, first branched ray 1 7/8 to 2 in head; adipose fin 6 1/4 to 6 1/3; A. I, 8, I, longest anterior ray 3 to 3 1/4; caudal 1 2/5 to 1 1/2?, well forked; least depth of caudal peduncle 4 2/5 to 4 3/5; pectoral 2 1/10 to 2 1/3; ventral 1 to 1 1/5.

Back and head above brown, mottled with darker. Back with 5 transverse darker bands and paler one in each interval. Mandible with 5 brown transverse bands, third widest. Lower surfaces of head and body whitish. Dorsal and caudal with transverse darker spots, other fins whitish.

West coast of Mexico.

44300 U. S. N. M. Acapulco, Mexico. Albatross Station. Length 148 mm. Type.

1 example U. S. N. M. Panama. Capt. J. M. Dow. Length mm.

Synodus foetens (Linnaeus)

Salmo foetens LINNAEUS, Syst. Nat., ed. 12, vol. 1, 1766, p. 513. In Carolina. -- FORSTER, Cat. Anim. North America, 1771, p. 22 (on CATESBY). -- BONNATERRE, Tabl. Ichth., 1788, p.165, pl. 70, fig. 285 (Carolina). -- SCHOEPF, Beob. Berlin, vol. 2, 1788, p. 176 (Charleston). -- GMELIN, Syst. Nat. Linnaeus, vol. 1, 1788, p. 1385. -- BLOCH, Naturg. Aus. Fische, vol. 8, 1794, p. 118, pl. 384, fig. 2 (Carolina). -- WALBAUM, Artedi Pisc., vol. 3, 1792, p. 82 (copied). -- SCHNEIDER, Syst. Ichth. Bloch, 1801, p. 404 (Carolina; Havana).

Saurus foetens VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 471 (Martinique, San Domingo, Bahia, Rio Janeiro, Cape Horn, Payta). -- HOLBROOK, Ichth. South Carolina, 1860, p. 187. -- GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 396 (New Orleans).

Synodus foetens GILL, Rep. U. S. Fish Comm., pt. 1, 1871-72, p. 810 (reference). -- JORDAN and GILBERT, Proc. U. S. Nat. Mus., vol. , 1878, p. 384 (Beaufort, N. C.). -- GOODE and BEAN, Proc. U. S. Nat. Mus., vol. , 1879, p. 342 (Key West). -- BEAN, Proc. U. S. Nat. Mus., vol. , 1880, p. 105 (Beaufort); vol. , 1882, p. 239 (Gulf of Mexico). -- JORDAN and GILBERT, Proc. U. S. Nat. Mus., vol. , 1882, p. 585 (Charleston); Bull. U. S. Nat. Mus., No. 16, 1882, p. 280 (compiled).

MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 135 (compiled). -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 538 (compiled); pt. 4, 1900, pl. 88, fig. 538. -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1905 (March), p. 87 (Marquesas Keys, Fla.); 1911 (1912), p. 563 (Longport, Beesley's Point, Atlantic City and Corson's Inlet, N. J.; Ft. Macon, N. C; South Carolina; Bayport and Marquesas Keys, Fla.); 1915, p. 529 (Trinidad); 1919, p. 146 (Lucea, Jamaica); Proc. Biolog. Soc. Washington, vol. 33, Dec. 30, 1920, p. 149 (New Jersey). -- MEEK and HILDEBRAND, Field Mus. Nat. Hist. Publ. No. 215, Zool. Ser. vol. 15, pt. 1, Dec. 20, 1923, p. 220 (Fox Bay, Colon, Mindi Cut). -- BREEDER, Bull. Bingham Oceanogr. Collection, vol. 1, art. 1, Oct. 19, 1927, p. 13 (Sandy Hook Bay, N. J.; Green Cay, St. Francis on Isle of Pines, north of Glover reef).

Osmerus albidus LACÉPÈDE, Hist. Nat Poiss., vol. 5, 1803, pp. 228, 235. Carolina.

Coregonus ruber LACÉPÈDE, Hist. Nat. Poiss., vol. 5, 1803, pp. 243, 263, pl. 4, fig. 3. American coasts (on PLUMIER).

Esox salmoneus MITCHILL, Trans. Lit. Philos. Soc. New York, vol. 1, 1815, p. 442. New York Bay.

Saurus longirostris (SPIX) AGASSIZ, Pisc. Brasil. Spix, 1829, p. 80, pl. 43. Brazil.

Saurus mexicanus CUVIER, Regne Animal, ed. 2, vol. 2, 1829, p. 314. Lake of Mexico.

Saurus spixianus POEY, Mem. Hist. Nat. Cuba, vol. 2, 1860, p. 304. Cuba.

Synodus spixianus POEY, Synop. Pisc. Cuba, 1868, p. 413 (Cuba); Enumeratio Pisc. Cuba, 1875, p. 397 (Cuba).

-- MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 134 (Havana; Key West).

Depth 5 4/5 to 9; head 3 2/5 to 4 3/5, width 1 7/8 to 2. Snout 3 1/4 to 3 7/8 in head; eye 4 1/2 to 7 1/2, 2 in snout, 1 1/2 in interorbital; premaxillary reaches 1 3/5 eye diameters behind eye, length 1 1/4 to 1 2/3 in head; interorbital 4 2/5 to 6, concave. Gill rakers as minute numerous spinules; gill filaments equal eye.

Scales 56 to 60 in lateral line to caudal base and 4 to 6 more on latter; 5 or 6 above, 6 or 7 below, 22 to 30 predorsal, 6 or 7 rows on postocular to preopercle ridge Axillary pectoral scale 3 1/3 in fin, ventral axillary scale 3 in fin. Scales with 3 basal radiating striae; circuli fine, not extended apically.

D. II, 8, I to II, 11, I, first branched ray 1 3/5 to 1 2/3 in head; adipose fin 4 1/2 to 6 1/2; A. II, 9, I to II, 11, I, first branched ray 2 4/5 to 3 1/6; caudal 1 2/5 to 1 1/2, well forked; least depth of caudal peduncle 4 4/5 to 5; pectoral 1 7/8 to 1 9/10; ventral 1 1/8 to 1 1/3.

Back brown, finely mottled with paler, under surfaces whitish. Iris silver white. Fins brownish, lower ones paler.

Massachusetts to Florida, Gulf of Mexico, West Indies, Bermuda, Caribbean Sea, Trinidad, Brazil.

2719 U. S. N. M. Beesley's Point, New Jersey. Prof. S. F. Baird. Length 110 mm.

6004 U. S. N. M. Jamaica. Length 322 mm.

15279 U. S. N. M. Long Island. Bureau of Fisheries 1527. Length 66 or 67 mm. 2 examples.

16831 U. S. N. M. Central Aquarium. Length 250 mm.

19692 U. S. N. M. Fort Macon, North Carolina. Dr. H. C. Yarrow. Length 168 mm.

22684 U. S. N. M. Wood's Holl, Massachusetts. V. N. Edwards. Length 48 mm.

23553 U. S. N. M. Key West, Florida. J. W. Velie. Length 78 mm.

23752 U. S. N. M. Rappanhanock River mouth, Virginia. T. B. Ferguson. Length 114 to 155 mm. 4 examples.

23813 U. S. N. M. Bermuda. Dr. G. B. Goode. Length 257 to 270 mm. 2 examples.25998 U. S. N. M. Charleston, South Carolina. C. C. Leslie. Length 260 mm.

26421 U. S. N. M. Far Rockaway, Long Island. A. N. Lawrence. Length 150? mm. Very poorly preserved.

26566 U. S. N. M. Pensacola, Florida. Silas Stearns. Length 190 mm.

26613 U. S. N. M. Cedar Keys, Florida. Silas Stearns. Length 75 mm.

30778 U. S. N. M. Pensacola, Florida. Silas Stearns. Length 225 mm. Very poor.

32076 U. S. N. M. Jamaica. Institute of Jamaica. Length 234 mm.

34470 U. S. N. M. Locality? Length 250 mm.

35098 U. S. N. M. Key West, Florida. Dr. D. S. Jordan. Length 150 mm. As Synodus spixianus.

35952 U. S. N. M. Great Long Island. Bureau of Fisheries. Length 168 mm.

36008 U. S. N. M. Oak Island Beach, Long Island. Lengt h 105 mm.

36824 U. S. N. M. Annapolis, Maryland. J. Hawkins. Length 247 mm.

38195 U. S. N. M. N. 36° 35' W. 74° 3' 30". In 1239 fathoms. Albatross Station. Length 45 mm. Postlarval.

38538 U. S. N. M. Jamaica. Length 245 mm.

38710 U. S. N. M. Key West, Florida. Length 342 mm.

39158 U. S. N. M. Canansie Bay, New York. Sept. 1887. T. R. Hicks. Length 180 mm.

42479 U. S. N. M. Cape Charles, Virginia. B. A. Bean. Length 120 mm.

43301 U. S. N. M. Bahia, Brazil. Albatross Station. Length 200 mm.

46303 U. S. N. M. Galveston, Texas. December 14-15, 1891. Dr. B. W. Evermann. Length 165 mm.

49276 U. S. N. M. Pine Island Sound, Florida. Dr. M. G. Miller. Length 320 mm.

51861 U. S. N. M. Horse Shoe Shoal, Beaufort, North Carolina. June 17, 1904. Length 51 to 78 mm. 2 examples.

51916 U. S. N. M. Beaufort, North Carolina. E. ". Gudger and B. A. Bean. Length 140 to 148 mm. 2 examples.

58933 U. S. N. M. Wood's Holl, Massachusetts. 1897. Length 123 to 124 mm. 2 examples.

61444 U. S. N. M. Beaufort, North Carolina. Bureau of Fisheries. Length 230 to 260 mm. 3 examples.

67756 U. S. N. M. St. George's Island, Maryland. August 16, 1897. M. C. Marsh. Length 125 to 158 mm. 2 examples.

67757 U. S. N. M. St. George's Island, Maryland. Sept. 15, 1892. A. Marmaduke. Length 130 to 143 mm. 2 examples.

67763 U. S. N. M. Cape Charles City, Virginia. Nov. 1, 1897? Length 78 mm.

68517 U. S. N. M. Tarpon Springs, Florida. Nov. 7, 1896. Length 39 to 55 mm. 5 examples.

73027 U. S. N. M. Pepperfish Key. Fish Hawk Station 7145. Length 97 mm.

73028 U. S. N. M. Ancilla, Florida. Fish Hawk Station 7148. Length 65 mm.

79620 U. S. N. M. Fox Bay, Colon, Panama. March 31, 1911. S. E. Meek and S. F. Hildebrand. Length 57 to 92 mm. 3 examples.

79621 U. S. N. M. Fox Bay, Colon, Panama. March 25, 1911, S. E. Meek and S. F. Hildebrand. Length 120 mm..

79625 U. S. N. M. Fox Bay, Colon, Panama. January 11, 1911, S. E. Meek and S. F. Hildebrand, Length 81 to 184 mm. 7 examples.

79626 U. S. N. M. Fox Bay, Colon, Panama. January 3, 1911, S. E. Meek and S. F. Hildebrand. Length 129 mm.

79627 U. S. N. M. Mindi Cut, Panama. February 3-4, 1911. S. E. Meek and S. F. Hildebrand. Length 198 mm.

79628 and 79629 U. S. N. M. Fox Bay, Colon, Panama. January 22, 1912. S. E. Meek and S. F. Hildebrand. Length 136 to 138 mm. 2 examples.

79630 U. S. N. M. Colon market, Panama. February 4, 1912. S. E. Meek and S. F. Hildebrand. Length 303 mm.

83857 U. S. N. M. Key West, Florida. Albatross Station . 1884. Length 33 to 42 mm. 20 examples, postlarval.

83945 U. S. N. M. Albatross Station 2607. Length 39 to 41 mm. 2 examples, postlarval.

85784 U. S. N. M. Wareham River, West Branch, Massachusetts. Sept. 7, 1892. Length 75 to 178 mm. 2 examples.

92032 U. S. N. M. Potomac River. J. E. Benedict. Length 233 mm.

1 example U. S. N. M. Providence, Rhode Island. T. B. Ferguson. Length 182 mm.

1 example U. S. N. M. Wood's Holl, Mass. August 13, 1885. Length 42 mm. Postlarval.

Synodus scituliceps Jordan and Gilbert

Synodus scituliceps JORDAN and GILBERT, Proc. U. S. Nat. Mus., vol. 4, 1881, p. 344. Mazatlan; vol. 5, 1882, p. 354 (Cape San Lucas); Bull. U. S. Fish Comm., vol. , 1882 ( ), pp. 106, 109 (Panama). -- MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 135 (compiled). -- JORDAN, STARKS, CULVER, WILLIAMS, Stanford Pulicat. Hopkins Lab., No. 1, 1895, p. 411 (Mazatlan). -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 537 (compiled). -- GILBERT and STARKS, Mem. California Acad. Sci., vol. 4, 1904, p. 50 (Panama Bay). -- MEEK and HILDEBRAND, Field Mus. Nat. Hist. Publ., No. 215, Zool. Ser. vol. 15, pt. 1, Dec. 20, 1923, p. 221 (Chame Point, Tobaga Island, Balboa, Panama).

Synodus jenkinsi JORDAN and BOLLMAN, Proc, U. S. Nat. Mus., vol. 12, 1889, p. 153. N. 8° 6' 30" W. 78° 51'; N. 8° 51'? W. 79° 31' 30"; Guaymas. -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 537 (compiled).

Depth 6 1/8 to 7 3/4; head 3 2/3 to 4 1/8, width 1 3/4 to 2 1.2. Snout 3 1/4 to 3 2/5 in head; eye 6 to 7 2/3, 1 4/5 to 2 1/5 in snout, 1 1/2 to 1 7/8 in interorbital though much greater than bony interorbital; premaxillary extends 3/4 to 1 1/3 eye diameters behind eye, length 1 3/5 to 1 2/3 in head; interorbital 4 1/3 to 6, slightly concave. Gill rakers as numerous minute denticles; gill filaments 1 to 1 1/2 in eye.

Scales 54 to 59 in lateral line to caudal base and 3 or 4 more on latter; 5 above, 6 or 7 below, 21 to 24 predorsal, 5 or 6 postocular to hind preopercle ridge. Pectoral axillary scale 2 3/4 to 3 1/2 in fin, ventral axillary scale 3 1/5 to 4 1/3 in fin. Scales with 3 basal radiating striae, edge scalloped; circuli very fine, not extended apically.

D. III, 9, I, first branched ray 1 1/2 to 1 4/5 in head; adipose fin 5 to 6 7/8; A. I, 10, I or III, 11, I, second branched ray 2 7/8 to 3; caudal 1 2/5 to 1 2/3, well forked; least depth of caudal peduncle 4 1/2 to 4 4/5; pectoral 1 2/3 to 2 1/8; ventral 1 1/8 to 1 2/5.

Back brown, mottled slightly with darker, under surfaces whitish. Iris pale or silvery to gray. Dorsal, adipose fin and caudal brown, also pectoral terminally, other fins whitish.

Off Pacific coast of Mexico and Central America.

41171 U. S. N. M. N. 8° 51' W. 79° 31' 30". Albatross Station . Length 327 mm. Type.

41201 U. S. N. M. N. 8° 44' W. 79°. Albatross Station Length 272 mm.

41409 U. S. N. M. N. 8° 6' W. 78° 31'. Albatross Station. . Length 255 mm.

46483 U. S. N. M. Albatross Station 3024. Length 122 mm.

46504 U. S. N. M. Carmen Island. March 18, 1889. Albatross Station . Length 178 mm.

46505 U. S. N. M. Albatross Station 3012. Length 100 to 108 mm. 3 examples.

46627 U. S. N. M. N. 31° 22' W. 114° 7' 45". In 17 fathoms. Albatross Station . Length 183 mm.

46656 U. S. N. M. Albatross Station . Length 85 mm.

46657 U. S. N. M. No. 31° 21' 15" W. 113° 59'. In 9½ fathoms. Albatross Station . Length 96 mm.

47485 U. S. N. M. Maztlan, Mexico. Dr. D. S. Jordan. Length 162 mm.

54506 U. S. N. M. Albatross Station 2822. Length 176 mm.

79622 U. S. N. M. Tobago Island, Panama. May 12-15, 1911. S. E. Meek and S. F. Hildebrand. Length 47 to 127 mm. 2 examples.

79623 U. S. N. M. Balboa, Panama. January 31, 1912. S. E. Meek and S. F. Hildebrand. Length 108 to 137 mm. 7 examples.

79624 U. S. N. M. Maos Island, Panama. February 5, 1912. S. E. Meek and S. F. Hildebrand. Length 120 mm.

79631 U. S. N. M. Chame Point, Panama. S. E. Meek and S. F. Hildebrand. Length 91 mm.

82020 U. S. N. M. Chame Point, Panama. Autumn 1912.
Robert Tweedlie. Length 32 to 46 mm. 15 examples.
82072 U. S. N. M. Chame Point, Panama. August 1913.
Robert Tweedlie. Length 20 to 49 mm. 55 examples.

Synodus acutus Garman

Synodus acutus GARMAN, Mem. Mus. Comp. Zool., vol. 24, 1899, p. 252. N. 7° 40' W. 79° 17' 50", 127 fathoms; N. 7° 26' 10" W. 79° 53' 50", 56 fathoms, off Panama.

Head 4 1/2 in total, narrowing forward, width 2. Snout 4 in head; eye 4, orbit cutting profile of crown; premaxillary extends 1/2 eye diameter behind eye; teeth small, slender, unequal, depressible, in narrow bands in jaws, palatines and at each side of middle of tongue; crown depressed, slightly concave, shallow groove on interorbital.

Scales 55 in lateral line; 5 above, 6 below, 4 rows on cheek.

D. 11, third ray long as postocular, origin midway between snout and adipose fin, fin long as ventral; A. 11; pectoral less than ventral, 2 1/2 in head.

Light grayish to grayish olive. Flanks below lateral line and sides of head yellowish to silvery. Belly silvery. Ten brown blotches on lateral line and half scale width lower second series of twice as many smaller and fainter. Faint indications of transverse bands on back, connecting with larger blotches in younger. Dorsal and caudal darker backward. Adipose fin with light edges. Anal and ventrals yellowish white.

Length not given. (Garman.)

Gulf of Panama.

Synodus lucioceps (Ayres)

Saurus lucioceps AYERS, Proc. Cal. Acad. Sci. 1855, p. 66. San Francisco, California. -- GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 397 (copied).

Synodus lucioceps JORDAN and GILBERT, Proc. U. S. Nat. Mus., vol. , 1880, p. 457 (San Francisco, Monterey Bay, Santa Barbara). -- JORDAN and JOUY, Proc. U. S. Nat. Mus., vol. , 1881, p. 13 (same localities). -- JORDAN and GILBERT, Proc. U. S. Nat. Mus., vol. 1881, p. 42; Bull. U. S. Nat. Mus., No. 47, pt. 1, 1882, 281 (compiled). -- MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 136 (compiled). -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 539 (compiled). -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911 (1912), p. 564 (San Francisco and California?).

Depth 8 2/5 to 9 1/3; head 3 9/10 to 4 1/8, width 2 1/8 to 2 2/5. Snout 3 1/4 to 3 1/2 in head; eye 4 1/2 to 6 3/4, 1 1/4 to 2 1/5 in snout, 1 1/2 to 2 in interorbital; premaxillaries extend 3/4 to 1 1/4 eye diameters behind eye, length 1 2/3 to 1 4/5 in head; interorbital 4 to 4 2/5, broadly concave. Gill rakers numerous, minute, sharp, slender denticles, greatly less than gill filaments, which 1 1/2 in eye.

Scales 64 to 66 in lateral line to caudal base and 5 or 6 more on latter; 8 above, 9 or 10 below, 35 to 38 predorsal, 8 rows on postocular to hind preopercle ridge. Ventral axillary scale 3 in fin. Scales with 3 or 4 basal radiating striae, edge scalloped; circuli very fine, not extended apically.

D. II, 10, I, first branched ray 1 2/3 to 2 in total head length; adipose fin 6 2/3 to 7 1/4; A. II, 11, I or II, 12, I, first branched ray 3 1/8 to 3 1/5; caudal 1 1/2 to 1 3/5, forked; least depth of caudal peduncle 4 3/4 to 5 1/2; pectoral 1 2/3 to 1 3/4; ventral 1 2/5 to 1 1/2.

Brownish above, obscurely mottled darker. Head brownish above, paler in front and lower surface still paler. Iris brassy or silvery. Branchiostegal region pale yellowish. Abdomen pale or dull buff to whitish. Dorsal and caudal uniform dull brown, latter little deeper along hind edge. Pectoral pale brown, deeper terminally. Ventral pale yellowish.

California.

22247 U. S. N. M. Monterey, California. Dr. Canfield. Length 233 to 278 mm. 3 examples.

26881 U. S. N. M. California. Dr. D. S. Jordan. Length 275 to 353 mm. 5 examples.

41870 U. S. N. M. San Diego, California. Dr. C. H. Eigenmann. Length 252 mm.

42413 U. S. N. M. Pacific coast of North America. Length 145 to 319 mm. 2 examples.

75602 U. S. N. M. Albatross Station 4304. Length 158 mm.

A. N. S. P. San Francisco, California. Bureau of Fisheries 27182. Length 143 mm.

A. N. S. P. Probably California? W. N. Lockington? Length 380 mm.

Synodus saurus (Linnaeus)

Salmo saurus LINNAEUS, Syst. Nat., ed. 10, vol. 1, 1758, p. 310. Europe; ed. 12, vol. 1, 1766, p. 511 (copied). -- BONNATERRE, Tabl. Ichth., 1788, p. 165 (Mediterranean). -- GMELIN, Syst. Nat. Linnaeus, vol. 1, 1789, p. 1376 (copied). -- WALBAUM, Artedi Pisc., vol. 3, 1792, p. 57 (on LINNAEUS). -- BLOCH, Naturg. Aus. Fische, vol. 8, 1794, p. 115, pl. 384, fig. 1 (Antilles, Red Sea, Mediterranean). -- SCHNEIDER, Syst. Ichth. Bloch, 1801, p. 404 (Europe).

Osmerus saurus FORSKAL, Descript. Animal., 1775, p. XIX. (Malta). -- LACEPEDE, Hist. Nat. Poiss., vol. 5, 1803, p. 235 (compiled).

Synodus saurus MEEK, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 135 (compiled). -- GOODE and BEAN, Oceanic Ichth., 1895, p. 57 (compiled). -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 537 (compiled). -- JORDAN and GUNN, Proc. Acad. Nat. Sci. Philadelphia, 1898, p. 340 (Canary Islands). -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911 (1912), p. 563 (Italy).

Saurus saurus ROULE, Res. Camp. Sci. Monaco, vol. 52, 1919, p. 33 (Villafranca, Azores, 20 meters). -- VAILLANT, Res. Camp. Sci. Monaco, vol. 52, 1919, p. 130 (Povocao, Azores, 10 meters).

Saurus (Synodus) saurus METZELAAR, Rapp. Kolonie Curacoa, vol. 2, pt. 1, 1919, p. 22 (Saba, Well Bay 1 1/8 to 8 fathoms).

Tirus marmoratus RAFINESQUE, Carr. Nuov. Animal Piant. Sicil., 1810, p. 56, pl. 1, fig. 3. Sicily.

Alepismaris risso RISSO, Hist. Nat. Eur. Merid., vol. 3, 1826, p. 458.

Laurida mediterranea SWAINSON, Nat. Hist. Animals, vol. 1, 1838, pp. 242, 246, fig. 48. Mediterranean; vol. 2, 1839, p. 288 (reference).

Saurus griseus LOWE, Trans. Zool. Soc. London, vol. 2, pt. 3, 1837 (1841), p. 188. Madeira. -- GUNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 394 (Madeira, St. Vencent, Naples, Mediterranean). -- STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, Math.-naturw. Kl., vol. 57, pt. 1, 1868, p. 728, pl. 6, fig. 2 (Teneriffe). -- VINCIGUERRA, Ann. Mus. Civico Stor. Nat. Genova, vol. 18, 1882 (1883), p. 619 (Santa Cruz de Teneriffa, Madeira); Atti Soc. Ital. Sci. Nat., vol. 34, 1892, p. 329 (Grand Canary). -- METZELAAR, Rapp. Kolonie Curacoa, vol. 2, pt. 1, 1919, p. 213 (compiled).

Saurus trivirgatus VALENCIENNES, Hist. Nat. Canaries, Poiss., vol. 2, pt. 2, 1836-44, p. 72, pl. 15, fig. 1. Canary Islands. -- STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, Math.-naturw. Kl., vol. 51, pt. 1, 1865, p. 403 (Santa Cruz, Teneriffe).

Saurus lacerta (not RISSO) BONAPARTE, Cat. Met. Pesc. Eur., 1846, p. 33 (Mediterranean). -- VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 463 (Toulon, Corsica, Ivica, Naples, Messina, Athens).

Synodus lacerta GOODE, Bull. U. S. Nat. Mus., No. , 1876, p. 68 (Bermuda).

Depth 6 2/3 to 8 1/8; head 4 to 4 1/4, width 1 7/8 to 2. Snout 4 to 5 in head; eye 5 3/4 to 6 1/2, 1 3/5 in snout, 1 4/5 in interorbital; premaxillary extends 1 to 2 eye diameters behind eye, length 1 2/5 to 1 3/4 in head; interorbital 4 1/4 to 5, concave. Gill rakers small low clusters of spinules, greatly shorter than gill filaments, which 1 1/3 in eye.

Scales 57 to 66 in lateral line to caudal base and 3 to 5 more on latter; 3 or 4 above, 5 or 6 below, 19 to 21 predorsal, 4 or 5 rows on postocular to hind preopercle ridge. Ventral axillary scale 3 to 3 3/5 in fin. Scales with 3 basal radiating striae, edge scalloped; circuli very fine, not extended apically.

D. II, 10, I, first branched ray 1 3/5 to 1 4/5 in head; adipose fin 4 3/4 to 6 2/3; A. II, 8, I to II, 10, I, third ray 2 3/5 to 3 2/5; caudal 1 2/5 to 1 3/5, forked; least depth of caudal peduncle 4 1/5 to 5; pectoral 2 1/5 to 2 2/7; ventral 1 to 1 1/10.

Pale brownish, still paler on whitish below. Back down over sides to lateral line mottled finely with deeper brown reticulations and wavy lines formed around or over inconspicuous narrow pale longitudinal bands, indistinct, broken and mostly ill defined, though one above lateral line most distinct. Head above all mottled with deep brownish lines. Iris silvered. Fins pale plain brownish white.

Azores, Canaries, Mediterranean.

12627 U. S. N. M. British Museum. Length 220 mm.

28424 U. S. N. M. Italy. Italian Commission. Length 234 mm.

45024 U. S. N. M. Greece. Length 250 mm.

48330 U. S. N. M. Bay of Naples, Italy. S. E. Meek. Length 112 mm.

to A..N. S. P. Italy. C. L. Bonaparte 80. Dr. T. B. Wilson. Length 184 to 259 mm.

Synodus altipinnis (Günther)

Saurus altipinnis GUNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 397. China.

Synodus altipinnis BLEEKER, Nederland. Tijds. Dierk., vol. 4, 1873, p. 147 (reference).

Trachinocephalus altipinnis CHU, Biol. Bull. St. John's University, No. 1, January 1931, p. 83 (reference).

Depth 7; head 4 1/3. Snout depressed, pointed, rather broader than long; eye equals interorbital, slightly concave; each frontal with fine, inconspicuous radiating striae.

Scales 59 in lateral line; 5 above, 7 below; no keel on scales of tail; 21 predorsal scales to occiput.

D. 11, higher than long; A. 12, front rays longer than posterior; pectoral reaches eleventh scale of lateral line, rays 13; ventral reaches thirteenth or fourteenth of median series of scales beginning behind its base, rays 8.

Silvery band along side of body and tail, below lateral line and broad as a scale. Length 255 mm. (Günther.)

China. Imperfectly described, perhaps it may belong in Trachinocephalus.

Genus Saurida Valenciennes

Saurida VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 499. Type Salmo tunbil BLOCH, designated by JORDAN, SNYDER and TANAKA, Journ. College Sci. Tokyo, vol. 32, art. 1, 1913, p. 53.

Body elongate, subcylindrical, tail tapering. Head oblong, depressed, rather small. Snout short, pointed. Eye small or moderate, with adipose lids. Mouth cleft very wide, bordered above by very long styliform premaxillary, to which thin long maxillary closely adherent. Teeth in jaws unequal, pointed, depressible, more or less curved, in several irregular rows. Two similar bands on each palatine, with inner band shorter and outer with 1 or 2 rows. Numerous fine teeth on tongue and gill arches. Gill membranes free. Pseudobranchiae well developed. Branchiostegals 13 to 16. Dorsal short, origin premedian. Adipose fin small, Anal postmedian, short. Caudal forked. Pectoral inserted above middle of height, rather short. Ventral with inner rays much longer than outer and inserted before dorsal.

I have been unable to consult the account of Saurida filamentosa Ogilby[1] as quoted by Mc Culloch.

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[1] New Fish; Queensland Coast, Dec. 20, 1910, p. 88. Off Cape Moreton, 73 fathoms (Endeavour).

Analysis of species

a[1]. Scales larger, 45 to 58.

b[1]. Pectoral less than postorbital; scales more than 50; D. 10 to 12.

c[1]. Pectoral 1 2/5 to 1 3/4.

d[1]. Indo Pacific form. *argyrophanes.*

d[2]. Atlantic form. *caribbaeus.*

c[2]. Pectoral 1 4/5 to 1 7/8.

e[1]. Pectoral not reaching ventral origin. *argentea.*

e[2]. Pectoral reaches opposite ventral or little farther. *gracilis.*

c[3]. Pectoral 1 9/10 to 2 1/10 in head. *tumbil.*

b[2]. Pectoral equals or longer than postorbital; scales less than 50; D. 12 or 13. *grandisquamis.*

a[2]. Scales smaller 63 or 64; pectoral 1 1/2 1 3/4, equals postocular. *eso.*

Saurida argyrophanes Günther

Saurus argyrophanes RICHARDSON, Ichth. China Japan, 1846, p. 302. Canton.

Saurida argyrophanes GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 400 (China; Japan); Ann. Mag. Nat. Hist., ser. 4, vol. 13, 1874, p. (Chefoo). -- PETERS, Monatsb. Akad. Wiss. Berlin, 1880, p. 924 (Ningpo). -- NAMIYE, Class. Cat., 1881, p. 106 (Tokyo). -- RUTTER, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 68 (reference). -- ISHIKAWA and MATSUURA, Prelim. Cat. Fishes Mus. Tokyo, 1897, p. 22. -- JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1900, p. 350 (Tokyo); Annot. Zool. Japon., 1901, p. 56 (Yokohama). -- JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, 1902, p. 329 (Formosa). -- EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 54 (San Fabian, Zamboanga).

-- JORDAN and HERRE, Proc. U. S. Nat. Mus., vol. 32, 1907, p. 519 (Wakanoura, Nagasaki, Kobe, Tokyo, Kawatana, Hakata, Hiroshima). -- JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 237 (Manila); Mem. Carnegie Mus., vol. 4, No. 4, 1909, p. 168 (Takao). -- FRANZ, Abh. Kön. Bayer. Akad. Wiss., vol. 4, Suppl. Band 1, 1910, p. 18 (Fukuura and Sagami Bay). -- SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 489 (Okinawa). -- JORDAN and THOMPSON, Mem. Carnegie Mus., vol. 6, No. 4, Sept. 1914, p. 212 (Osaka; Misaki). -- JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, June 27, 1925, p. 155 (Misaki, Kagoshima Bay, Tokyo, Kobe). -- MORI, Journ. Pan Pacific Research Inst., vol. 3, No. 3, July-Sept. 1928, p. 4, (Korea).

Aulopus elongatus SCHLEGEL, Fauna Japonica, Poiss., pts. 10 to 14, 1846, p. 233, pl. 105, fig. 2. Nagasaki.

Saurida tumbil (not BLOCH) BLEEKER, Nederland. Tijds. Dierk., vol. 4, 1874, p. 147 (Amoy). -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 142 (part). -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929, p. 602 (Hong Kong).

Depth 7 1/4 to 7 2/5; head 3 7/8 to 4 2/5, width 1 4/5 to 2. Snout 3 3/4 to 4 1/3 in head; eye 5 2/5 to 6 4/5, adipose lids expose about half eye, narrow in young, 1 1/3 to 1 1/2 in snout, 1 1/4 to 2 in interorbital; premaxillary extends 1 1/4 to 2 eye diameters behind eye, length 1 2/5 to 1 1/2 in head; dentition exposed, in 4 or 5 rows with innermost largest and 2 rows on palatines; interorbital 3 1/3 to 4, broad, depressed concavely. Gill rakers as very fine, minute, short, villiform teeth; gill filaments 1 1/3 in eye.

Scales 49 to 55 in lateral line to caudal base and 3 more on latter; 5 above, 5 or 6 below, 16 to 20 predorsal to occiput, 4 rows on postocular. Pectoral and ventral axillary scaly flaps each half of fin. Scales with 3 basal radiating striae, edge scalloped or notched; circuli very fine, not extended apically where entire and exposed edge fringed.

D. I or II, 9, I or I or II, 10, I, second simple ray 1 1/5 to 1 2/5 in head; adipose fin 4 1/6 to 6 1/3; A. II, 8, I or II, 9, I, second simple ray 2 1/3 to 2 3/5; caudal 1 1/5 to 1 1/4, deeply forked and slender lobes pointed; least depth of caudal peduncle 3 3/5 to 3 3/4; pectoral 1 2/5 to 1 2/3; ventral 1 1/3 to 1 1/2.

Back pale olivaceous brown, below still paler to whitish. Iris pale straw brown. Dorsal, caudal and pectoral brownish, ventral and anal more whitish and adipose fin paler brown than back.

China, Formosa, Rui Kui, Japan, Korea. Apparently distinguished by narrow adipose lids and large scales. From Saurida grandisquamis it differs chiefly in the smaller scales 52 to 58, though is allied in pectoral nearly long as head without snout.

22619 U. S. N. M. Japan. Japanese Government. Length 218 mm. As Aulopus elongatus.

26254 U. S. N. M. Japan. Prof. E. S. Morse. Length 238 mm.

37979 U. S. N. M. Japan. Length 302 mm.

44930 U. S. N. M. Japan. Japanese Government. Length 320? to 335? mm. 3 examples.

49477 U. S. N. M. Tokyo. Length 218 mm.

59772 U. S. N. M. Yamagawa, Japan. Dr. H. M. Smith. Length 182 mm. As Saurida japonica.

59773 U. S. N. M. Kochi, Japan. May 7, 1902. Dr. H. M. Smith. Length 193 mm. As Saurida japonica.

59774 U. S. N. M. Yamagawa, Japan. Dr. H. M. Smith. Length 143 mm. As Saurida japonica.

62332 U. S. N. M. Tokyo, Japan. D. S. Jordan and J. O. Snyder. Length 230 to 274 mm. 2 examples.

64645 U. S. N. M. Kawatana, Japan. Length 150 mm.

64646 U. S. N. M. Nagasaki, Japan. D. S. Jordan and J. O. Snyder. Length 145 to 228 mm. 5 examples.

64647 U. S. N. M. Tokyo, Japan. D. S. Jordan and J. O. Snyder. Length 455 to 518 mm. 2 examples.

71274 U. S. N. M. Shimizu, Suruga, Japan. Bureau of Fisheries. Length 205 mm.

72165 U. S. N. M. Manila. R. C. Mc Grego. Length 278 mm.

Saurida caribbaeus Breeder

Saurida caribbaeus BREEDER, Bull. Bingham Oceanogr. Collection, vol. 1, art. 1, Oct. 19, 1927, p. 14, figs. 7 and 9. North of Glover Reef, 48 fathoms (off Yucatan). -- PARR, Bull. Bingham Oceanogr. Collection, vol. 3, art. 4, July 1930, p. 7 (note).

Saurida gracilis (not QUOY and GAIMARD) METZELAAR, Rapp. Kolonie Curacoa, vol. 2, pt. 1, 1919, p. 23. (off St. Eustatius).

Saurida tumbil (not BLOCH) METZELAAR, Rapp. Kolonie Curacoa, vol. 2, pt. 1, 1919, p. 24 (off Eustatius).

Saurida suspicio BREEDER, Bull. Bingham Oceanogr. Collection, vol. 1, art. 1, Oct, 19, 1927, p. 15, figs. 8 and 9. Misteriosa Bank (between Yucatan and Jamaica). -- PARR, Bull. Bingham Oceanogr. Collection, vol. 3, art. 4, July 1930, p. 7 (Cat Island, Bahamas).

Depth 6 1/2 to 7 3/4; head 3 3/5 to 4, width 2 1/5 to 2 1/3. Snout 3 7/8 to 4 in head from snout tip; eye 3 3/4 to 4 1/10, greater than snout or interorbital; premaxillary extends 4/5 to 1 eye diameter behind eye, length 1 1/2 in head from snout tip; interorbital 4 1/10 to 4 1/3, bony interorbital 1 2/3 in eye. Gill rakers as minute spinules, in 6 groups on lower branch of first arch; gill filaments 1 1/3 in eye.

Scales 48 to 50 in lateral line to caudal base and 3 more on latter; 4 above, 5 below, 15 to 17 predorsal, 4 rows on cheek to hind preopercle ridge. Pectoral axillary scale 2 1/4 in fin, ventral axillary scale 2 3/5 in fin. Scale with single basal radiating stria, notched at scale edge; circuli few, not extended apically.

D. II, 6, I to II, 9, I, first branched ray 1 1/5 in total head length; adipose fin 3 1/2 to 6; A. I, 9, I or I, 10, I, longest anterior ray 2 1/3 to 2 2/3; caudal 1 1/4? to 1 2/5, well forked; least depth of caudal peduncle 4 to 4 1/5; pectoral 1 3/5 to 1 3/4; ventral 1 1/4 to 1 2/5.

Back and upper surfaces pale brown, with 7 slightly darker transverse bands made up chiefly of blackish dots and extending below lateral line on side of body. Each interspace with less distinct similar band transversely on back and blotch on and below lateral line. Iris whitish. Pale heart shaped blotch on cranium close behind interorbital. Fins pale, caudal dark grayish terminally.

Caribbean Sea, Bahamas. Poey has evidently listed this species as Saurida,[1] though apparently never given any specific name. The interesting specimen from Porto Rico seems to have escaped the attention of Evermann and Marsh in their work on that island. Although I have no examples of similar size I cannot but think Saurida suspicio only a variant of younger growth.

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[1] Anal. Soc. Espan. Hist. Nat., Madrid, vol. 4, 1875, p. 145.

37460 U. S. N. M. Cuba. Prof. F. Poey. Length 83 to 94 mm. 4 examples.

76512 U. S. N. M. Porto Rico. Fish Hawk Station 151. Length 65 mm.

Saurida argentea Macleay

Saurida argentea MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, pt. 2, Sept. 12, 1881, p. 220. Endeavour River, North Queensland. -- KENT, Great Barrier Reef, 1893, p. 298, pl. 46, fig. 3 (Cooktown, Townsville, Bowen, Rockhampton), pp. 312, 370 (reference).

Depth 10 in total length; head 7. Head flat above and tapers to rounded snout, which considerably longer than eye diameter. Short predorsal ridge.

Scales 55 in lateral line; 5 above, 8 below.

D. 12, higher than long, forst rays much higher than body; A. 10; caudal forked; pectoral not nearly reaching ventral, placed only very little in front of vertical from dorsal.

Bluish above, whitish beneath, most of scales, showing silvery center. Middle rays of tail blackish. Length 178 mm. (Macleay.)

Endeavour River, Queensland.

Saurida gracilis (Quoy and Gaimard)

Saurus gracilis QUOY and GAIMARD, Voy. Uranie, Zool., 1824, p. 224. Hawaiian Islands; Mauritius.

Saurida gracilis JENKINS, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 433 (Honolulu). -- SNYDER, Bull. U. S. Fish Comm., vol. 22, 1902 (1904), p. 521 (Hanalei Bay, Kauai). -- JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 65 (Hilo; Honolulu). -- GILBERT, Bull. U. S. Fish Comm., vol. 23, pt. 2, 1903 (1905), p. 589 (off northern Maui in 14 to 18 fathoms). -- SEALE, Occas. Pap. Bishop Mus., vol. 4, No. 1, 1906, p. 5 (Shortland Island, Solmons). -- JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, 1905(1906), p. 189 (Apia).

JORDAN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 6 (Manila). -- EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 54 (Bacon). -- JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 237 (Cuyo); Mem. Carnegie Mus., vol. 4, No. 4, 1909, p. 168 (Takao). -- GUNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, 1910, p. 376 (Solomons; Fiji; Society Islands; Hawaii). -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911, p. 509 (types of Synodus sharpi; Hawaiian Islands; Hilo). -- KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, 1911, p. 244 (Makemo, Paumoto; Truk Group, Carolines). -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 143 (fig. 53, p. 141) (Nias, Macassar, Menado, Salayer, Buton, Biaru, Siau, Karkaralong Islands, Obi Major, Ambon, Nusa Laut, Banda, Tuir, Kei Islands), p. 150 (description of larva).

-- FOWLER, Copeia, No. 112, Nov. 20, 1922, p. 82 (Hawaii); Bull. Bishop Mus., No. 22, 1925, p. 4 (Guam); Mem. Bishop Mus., vol. 10, 1928, p. 66 (Honolulu, Shortlant Island, Guam, Samoa, Truk, Society Islands, Hilo, types of Synodus sharpi).

-- MC CULLOCH, Fishes New South Wales, ed. 2, 1927, p. 20.

Saurida nebulosa VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 504, pl. 648. Mauritius, New Guinea, Timor, Tahiti. -- GUICHENOT, Notes Ile Reunion, vol. 2, 1862, p. 29. -- GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 399 (Madagascar, Amboina, Hawaiian Islands). -- BLEEKER, Atlas Ichth. Ind. Neerland., vol. 6, 1866-72, p. 156, pl. (1) 277, fig. 1 (Nias, Celebes, Singapore,); Flores, Solor, Timor, Halmahera, Ternate, Buro, Amboina, Ceram, Banda, Aru, New Guinea); Versl. Kön. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 2, 1868, p. 306 (Aru Islands); Nederland. Tijds. Dierk., vol. 1, 1868, p. 254 (Wahai, Ceram), p. 272 (Atapupu, Timor). -- SCHMELTZ, Cat. Mus. Godeffroy, No. 4, 1868, p. 24 (Uvea). -- KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 591 (Red Sea). -- SCHMELTZ, Cat. Mus. Godeffroy, No. 5, 1874, p. 35 (Uea; Rarotonga). -- PETERS, Monatsb. Akad. Wiss. Berlin, 1876 91877), p. 846 (Amboina).

-- STREETS, Bull. U. S. Nat. Mus., No. 7, 1877, p. 6 (Honolulu). -- DAY, Fishes of India, pt. 4, 1878, p. 505. -- BLEEKER, Arch. Neérland. Sci. Nat. Harlem, vol. 13, 1878, p. 38 (New Guinea). -- BLEEKER, Verh. Kön. Akad. Wet. Amsterdam, vol. 18, No. 3, 1879, p. 2 (Mauritius). -- MACLEAY, Proc. Linn. Soc. New. South Wales , vol. 6, 1881, p. 218 (Port Jackson). -- MEYER, Anal. Soc. Espan. Hist. Nat. Madrid, vol. 14, 1885, p. 41 (Kordo, Mysore). -- DAY, Fauna Brit. India, Fishes, vol. 1, 1889, p. 411. -- STEINDACHNER, Abh. Senckenberg. Ges., vol. 25, 1900, p. 449 (Ternate).

Dentex nebulosa (SOLANDER) VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. . Tahiti.

Saurus ferox EYDOUX and SOULEYET, Voy. Bonite, Zool., vol. 1, 1842, p. 197, pl. 7, fig. 3. Locality unknown. -- RAMSAY, Proc. Linn. Soc. New South Wales, vol. 8, 1881, p. 177 (Port Jackson).

Synodus sharpi FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 497, pl. 19, fig. 2. Hawaiian Islands.

Saurida tumbil (not BLOCH) FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 498 (Hawaiian Islands).

Synodus varius (not LACEPEDE) JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 22, pt. 1, 1903 (1905, p. 63 (65) (synonymy).

Synodus japonicus (not HOUTTUYN) JORDAN and HERRE, Proc. U. S. Nat. Mus., vol. 32, 1907, p. 516 (synonymy).

Depth 5 3/5 to 7 4/5; head 3 2/3 to 4 1/4, width 1 7/8 to 2. Snout 3 7/8 to 4 1/3 in head; eye 4 to 6, 1 1/3 in snout, 1 1/3 to 1 2/5 in interorbital; adipose lids rather narrow; premaxillary extended 1 1/5 to 2 eye diameters behind eye, length 1 2/5 to 1 3/5 in head; interorbital 4 to 6, slightly concave. Gill rakers 30 + 50, fine denticles, barely 1/3 gill filaments, which 1/2 of eye.

Scales 44 to 51 in lateral line to caudal base and 3 or 4 more on latter; 4 above, 4 to 6 below, 17 or 18 predorsal, 5 rows on postocular. Axillary pectoral scale 3 in fin, ventral axillary scale 3 in fin. Scales with 2 or 3 basal radiating striae, edge scalloped; circuli fine.

D. II, 8, I or II, 9, I, first branched ray 1 1/5 to 1 2/5 in head; adipose fin 5; A. IV, 6, I to IV, 8, I, first branched ray 2 1/8 to 2 1/4; caudal 1 1/4 to 1 1/3, forked; least depth of caudal peduncle 4 to 4 1/3; pectoral 1 4/5 to 1 7/8; 1 1/8 in postocular; ventral 1 1/6 to 1 1/4 in head.

Brown, paler to whitish below. Back with 7 dusky brown saddles, interspaces with transverse streaks of paler brown. Along lateral line brownish blotch at each dark saddle and streaks over back. Head above mottled with darker. Four deep brown transverse blotches on mandible. Iris brown. Fins pale brown, each dorsal ray with 7 deep brown spots. Caudal with 3 irregular broad deep brown transverse bands, in pale interspaces 3 or 4 narrow paler lines. Anal whitish. Pectoral with 4 transverse irregular wavy brown lines and 3 on ventral only paler.

Red Sea, Mauritius, Madagascar, Singapore, East Indies, Philippines, Formosa, Rui Kui, Micronesia, Melanesia, Polynesia, Hawaii.

51030 U. S. N. M. Hawaii. Bureau of Fisheries 03170. Length 182 mm.

52295 U. S. N. M. Apia, Samoa. Bureau of Fisheries. Length 190 mm.

53363 U. S. N. M. Honolulu. Bureau of Fisheries. Length 210? mm.

55203 U. S. N. M. Hilo, Hawaii. Albatross Collection 1902. Length 63 mm.

55491 U. S. N. M. Bureau of Fisheries. Length 132 to 157 mm. 3 examples.

56148 U. S. N. M. Bureau of Fisheries 3673. Length 190 mm. Pectoral 1 1/6 in postocular. As Saurida argyrophanes.

56220 U. S. N. M. Bureau of Fisheries 3983. Length 120 mm.

56295 U. S. N. M. Cavite, Luzon. G. A. Lung. Length 97 to 108 mm. 3 examples. Pectoral 1 1/6 to 1 1/4 in postocular. As Saurida argyrophanes.

66012 U. S. N. M. Makemo, Paumotus. Albatross Collection 1899. Length 167.

75442 U. S. N. M. Nafa, Okinawa, Rui Kui, Albatross Collection 1906. Length 128 to 180 mm. 4 examples. Pectoral 1 1/5 to 1 1/3 in postocular. As Saurida argyrophanes.

78078 U. S. N. M. Bureau of Fisheries. Length 57 to 105 mm. 5 examples.

A. N. S. P. Hawaiian Islands. Dr. J. K. Townsend. Length 146 to 168 mm. As Saurida tumbil.

16084 A. N. S. P. Hawaiian Islands. Dr. Benjamin Sharp. Type of Synodus sharpi. Length 78 mm.

16085 and 16086.A. N. S. P. Hawaiian Islands. Dr. Benjamin Sharp. Paratypes of Synodus sharpi. Length 50 to 63 mm.

A. N. S. P. Hilo, Hawaii. Bureau of Fisheries. Length 63 to 103 mm.

Saurida tumbil (Bloch)

Salmo tumbil BLOCH, Naturg. Aus. Fische, vol. 9, 1795, p. 112, pl. 430. No locality (Collection Herr John).

Saurida tombil VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 500 (Malabar, Coromandel, Mauritius, Macao, Red Sea, Suez, Waigiu, Vanikoro). -- BLEEKER, Verh. Batav. Genootsch. (Japan), vol. 25, 1853, p. 19 (reference); (Japan), vol. 26, 1857, p. 6 (reference); Act. Soc. Sci. Ind. Neêrland., No. 3, vol. 3, 1857-58, p. 6 (Japan); No. 5, vol. 5, 1858-59, p. 3 (Nagasaki); Nederland. Tijds. Dierk., vol. 2, 1865, p. 176 (Siam; compiled).

Saurida tumbil CANTOR, Journ. Asiatic Soc. Bengal, vol. 18, pt. 2, 1849, p. 1421 (Pinang, Malay Peninsula, Singapore). -- GUNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 399 (Pinang specimens). -- KLUNZINGER, Verh. zool. bot. Wien, vol. 21, 1871, p. 591 (Red Sea). -- BLEEKER, Atlas Ichth. Ind. Neer-land., vol. 6, 1866-72, p. 155, pl. (1) 277, fig. 4 (Java, Bali, Bawean, Sumatra, Nias, Pinang, Singa-pore, Bintang, Banka, Celebes, Waigiu). -- ALLEYNE and MACLEAY, Proc. Linn. Soc. New South Wales, vol. 1, pt. 4, 1877, p. 348 (New Guinea). -- GUNTHER, Rep. Voy. Challenger, vol. 1, pt. 6, 1880, p. 71 (Inland Sea of Japan). -- MEYER, Anal. Soc. Espan. Hist. Nat. Madrid, vol. 14, 1885, p. 41 (Kordo, Mysore). -- BOULENGER, Proc. Zool. Soc. London, 1887, p. 665 (Muscat). -- ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 572 (Luzon, Manila Bay, Navotas).

-- WAITE, Mem. Australian Mus., vol. 4, 1899, p. 53 (Newcastle Bight, in 28-40 fathoms). -- DUNCKER, Mitteil. Naturh. Mus. Hamburg, vol. 21, 1903 (1904), p. 185 (Singapore). -- FOWLER, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, 1904, p. 501 (Padang).

-- WAITE, Rec. Australian Mus., vol. 6, pt. 2, 1905, p. 58 (Freemantle). -- STEINDACHNER, Denks. Acad. Wiss. Wien, Math.-naturw. Kl., vol. 71, pt. 1, 1907, p. 154 (Gischin). -- GILCHRIST, and THOMPSON, Ann. South African Mus., vol. 6, 1908-11, p. 265 (Natal). -- JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, No. 4, 1909, p. 108 (Takao). -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911, p. 569 (Padang specimens).

-- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 142 (Batavia, Nias, Singapore, Makassar, Ambon).

-- GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, 1917, p. 307 (reference). -- MC CULLOCH, Fishes New South Wales, ed. 2, 1927, p. 20, pl. 6, fig. 67a. -- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 261 (Orion; Philippines). -- MORI, Journ. Pan Pacific Research Inst., vol. 3, No. 3, July-Sept. 1928, p. 4 (Chinnampo, Korea). -- FOWLER, Mem. Bishop Mus., vol. 10, 1928, p. 66 (compiled).

Laurida tumbel SWAINSON, Nat. Hist. Animals, vol. 2, 1839, p. 288 (on BLOCH).

Synodus tumbil WAITE, Mem. Australian Mus., vol. 4, 1899, p. 53 (Newcastle Bight, in 28 to 40 fathoms).

Saurus badi CUVIER, Regne Animal., vol. 2, ed. 2, 1829, p. 314 (on Badi mottah RUSSELL, Fishes of Coromandel, vol. , 1803, p. 56, pl. 172, Vizagapatam). -- BLEEKER, Journ. Indian Archipelago, vol. 3, 1849, p. 69 (Macassar). -- CANTOR, Journ. Asiatic Soc. Bengal, vol. 18, pt. 2, 1849, p. 1252 (Pinang, Malay Peninsula, Singapore).

Saurida badi JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 772 (Negros).

Saurus badimottah RÜPPELL, Neue Wirbelth. Fische, 1835, p. 77.

Saurus undosquamis RICHARDSON, Voy. Erebus and Terror, Ichth., 1844-48, p. 138, pl. 51, figs. 1-6. North West Australia. -- KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, Math.-naturw. Kl., vol. 80, pt. 1, 1879, p. (Queensland).

Saurida undosquamis GÜNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 400 (type). -- MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, 1881, p. 218 (copied). -- OGILBY, Commerc. Fish Fisher. Queensland, 1915, p. 48 (Brisbane). -- REGAN, Ann. Durban Mus., vol. 2, 1917-20, p. 76 (Natal).

Saurida australis CASTELNAU, Proc. Linn. Soc, New South Wales, vol. 3, 1879, p. 393. Port Jackson. -- MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, 1881, p. 218 (reference).

Saurida truculenta MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, pt. 2, Sepy. 12, 1881, p. 219. Port Jackson.

?Saurida ferox (not EYDOUX and SOULEYET) RAMSAY, Proc. Linn. Soc. New South Wales, vol. 8, pt. 1, June 19, 1883, p. 177 (Port Jackson).

Saurida argyrophanes (not RICHARDSON) ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 572 (Luzon, Manila Bay, Navotas).

Synodus japonica (not HOUTTUYN) JORDAN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 5 (Cavite). -- FOWLER, Copeia, No. 58, June 18, 1918, p. 62 (Philippines).

Depth 7 to 7 2/5; head 4 to 4 1/6, width 1 2/3 to 2. Snout 4 to 4 1/4 in head from upper jaw tip; eye 5 to 6, 1 1/4 to 1 2/5 in snout, 1 to 1 3/4 in interorbital; adipose eyelids cover nearly 1/2 of eye; premaxillary extends nearly 1 1/4 to 1 3/5 eye diameters behind eye, length 1 1/5 to 1 3/7 in head from snout tip; interorbital 3 to 5, gently concave. Gill rakers numerous minute denticles; gill filaments 1 1/4 in eye.

Scales 51 to 53 in lateral line to caudal base and 3 or 4 more on latter; 5 above, 4 to 6 below, 18 to 20 predorsal, 5 or 6 postocular rows. Axillary pectoral scale 1 1/5 to 1 2/5 in fin, axillary ventral scale 1 3/5 to 1 4/5 in fin. Scales with 3 basal radiating striae, edge scalloped; circuli very fine, not extended apically which with feeble radiating striae leaving fringed edge.

D. II, 9, I, first branched ray 1 1/8 to 1 1/5 in total head length; adipose fin 5 to 5 2/5; A. II, 8, I to II, 10, I, first branched ray 2 2/5 to 2 2/3; caudal 1 1/8 to 1 1/4, forked; least depth of caudal peduncle 3 3/4 to 3 7/8; pectoral 1 9/10 to 2 1/10, 1 1/8 to 1 1/5 in postocular; ventral 1 1/4 to 1 1/2 in head.

Back brown, each scale with paler spots, thus forming longitudinal rows. Under surfaces of body paler to whitish. Iris neutral gray. Fins brown. Dorsal and caudal grayish terminally. Pectoral with broad dusky brown lower hind border. Ventral with dusky medially and terminally, though border all around paler.

Red Sea, Mauritius, Natal, India, Malay Peninsula, Pinang, Singapore, Siam, East Indies, Philippines, Formosa, Japan, Korea, Queensland, North West Australia, Western Australia, New South Wales.

6720 and 6721. Manila market. December 4, 1908. Length 305 to 329 mm.

8491. Mantaquin Bay, Palawan. April 2, 1909. Length 235 to 269 mm. 2 examples.

7887. Mariveles Bay, Manila Bay, Luzon. January 29, 1909. Length 300 mm.

7985. Pagapas Bay, Luzon. February 20, 1909. Length 333 mm.

8575 and 8576. San Fernando Point Light, N. 39° E., 8.4 miles (N. 16° 30' 36" E. 120° 11' 6"), west coast Luzon. In 45 fathoms. May 10, 1909. Length 278 to 288 mm.

8302. Sorsogon market, Luzon. March 12, 1909. Length 260 mm.

47601 U. S. N. M. Red Sea, New York Museum. Length 264 to 295 mm. 3 examples.

51995 U. S. N. M. Negros, Philippines. Dr. Bashford Dean. Length 275 mm. As Saurida badi.

72525 U. S. N. M. Batavia, Java. April 2, 1909. O. Bryant and W. Palmer. Length 94 mm.

A. N. S. P. Padang, Sumatra. A. W. Harrison and H. L. Hiller. Length 125 to 343 mm. When fresh in arrack olivaceous brown above, below whitish. Iris slaty, yellowish circle around pupil. Fins mostly pale olivaceous brownish. Dorsal unmarked, except slight dusky shade terminally. Caudal similar, upper edge with faint traces of narrow transverse brownish spots. Pectoral slaty terminally. Ventral paler. Anal whitish.

Saurida grandisquamis Günther

Saurida grandisquamis GUNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 400. Louisiades; Australia? (Mac Gillioray). -- ALLEYNE and MACLEAY, Proc. Linn. Soc. New South Wales, vol. 1, pt. 4, 1877, p. 348 (Cape Grenville, Queensland). -- GUNTHER, Rep. Voy. Challenger, vol. 1, pt. 6, 1880, p. 50 (Arafura Sea). -- MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, 1881, p. 219 (Cape Grenville). -- DUNCKER, Mitteil. Naturh. Mus. Hamburg, vol. 21, 1903 (1904), p. 185 (Kuala Lumpur). -- GUNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, 1910, p. 377 (Louisiades; Arafura Sea). -- WEBER, Abh. Senckenberg. Naturg. Ges., vol. 34, 1911, p. 22 ( ). -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 141 (Aru Islands).

-- FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 3 (Takao, Formosa). -- JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, June 27, 1925, p. 155 (compiled). -- FOWLER, Mem. Bishop Mus., vol. 10, 1928, p. 66 (compiled); Proc. Acad. Nat. Sci. Philadelphia, 1929, p. 603 (Hong Kong).

Saurida macrolepis TANAKA, Zool., Mag., vol. 29, 1916, p. 39.

Depth 6 2/3 to 9 1/4; head 3 4/5 to 4 1/6, width 2 to 2 1/8. Snout 4 to 5 in head; eye 3 4/5 to 5, 1 to 1 1/8 in snout, subequal with or little greater than interorbital; premaxillary extends eye diameter behind eye, length 1 2/5 to 2 2/5 in head; interorbital 5 to 6, depressed, slightly concave medially. Gill rakers as narrow band of very numerous, fine, irregular, close set, variable denticles; gill filaments 1 1/3 in head.

Scales 42 to 45 in lateral line to caudal base and 3 or 4 more on latter; 3 or 4 above, 5 below, 18 to 21? predorsal. Scales with 2 to 4 basal radiating striae, edge scalloped; apical edge fimbriate.

D. II, 9, I or III, 10, I, first branched ray 1 in head; adipose fin 3 1/2 to 3 3/5; A. II or III, 9, I, first branched ray 1 7/8 to 2 1/3; caudal 1 1/8 to 1 1/4, well forked; least depth of caudal peduncle 3 1/4 to 3 1/3; pectoral 1 1/4 to 1 2/5; ventral 1 1/4 to 1 1/3.

Largely pale brown, mottled with darker on back, sides and lower surface very light brown. Iris gray brown. Dorsal, caudal and pectoral with dusky or grayish, other fins whitish.

East Indies, China, Formosa, Japan, Melanesia, Queensland.

76632 U. S. N. M. Takao, Formosa. Dr. Fred Baker.
Length 87 mm.
76633 U. S. N. M. Takao, Formosa. Dr. Fred Baker.
Length to mm. 2 examples.
76634 U. S. N. M. Takao, Formosa. Dr. Fred Baker.
Length 53 to 70 mm. 5 examples.

A. N. S. P. Hong Kong. April 1929. Henry W. Fowler. Length 220 mm.

Saurida eso Jordan and Herre

Saurida eso JORDAN and HERRE, Proc. U. S. Nat. Mus., vol. 32, 1907, p. 520, fig. 1. Wakanoura, Kobe, Tsuruga. -- FRANZ, Abh. Kön. Bayer. Akad. Wiss., vol. 4, Suppl. Band 1, 1910, p. 18 (Aburatsubo). -- JORDAN and METZ, Mem. Carnegie Mus., vol. 6, No. 1, June 1913, p. 12, fig. 12 (Fusan, Korea). -- JORDAN and THOMPSON, Mem. Carnegie Mus., vol. 6, No. 4, Sept. 1914, p. 212 (Osaka; Shimomoseki). -- JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, June 27, 1925, p. 155 (Tokyo, Kobe, Mikawa Bay, Toyama, Miyazu; Hong Kong). -- MORI, Journ. Pan Pacific Research Inst., vol. 3, No. 3, July-Sept. 1928, p. 4 (Fusan).

Synodus japonica (not HOUTTUYN) JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, 1902, p. 329 (Wakanoura, Japan).

Saurida tumbil (not BLOCH) WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 142 (part).

Depth 7 3/5 to 7 7/8; head 4 1/4 to 4 2/3, width 1 1/2 to 1 4/5. Snout 3 1/3 to 4 2/5 in head; eye 6 to 6 1/2, 1 1/2 to 1 2/3 in snout, 1 4/5 to 2 in interorbital; adipose lids expose 1/2 of eye, 3/5 of eye in smaller example; premaxillary extends 1 1/2 eye diameters behind eye, length 1 1/2 in head; teeth fine, villiform, in 4 or 5 series in jaws with innermost longer, all exposed; 2 rather broad bands of similar teeth on palatines; interorbital 2 7/8 to 3 1/4, broadly depressed, slightly concave. Gill rakers as minute spinules; gill filaments 1 1/6 in eye.

Scales 59 to 60 in lateral line to caudal base and 4 more on latter; 5 above, 8 below, 23 or 24 predorsal, 4 postocular rows. Pectoral axillary scale 1 3/4 to 1 4/5 in fin, ventral axillary scale 2 1/4. Caudal scaly. Scales with 3 or 4 basal radiating striae, edge scalloped; circuli very fine, not extended apically.

D. II, 8, I or II, 9, I, first branched ray 1 1/3 in head; adipose fin 4 3/4 to 7 3/4; A. II, 9, I, first branched ray 2 1/10 to 2 1/2; caudal 1 1/8 to 1 1/2, forked, lobes pointed; least depth of caudal peduncle 3 1/3 to 3 2/5; pectoral 1 1/2 to 1 3/4, equals postocular; ventral 1 1/6 to 1 1/5 in head.

Brown above lateral line, scales with paler centers, below paler or brownish white. Iris grayish, adipose lids pale. Dorsal, caudal and pectoral brown, tipped with dusky. Anal and ventral pale brown.

China, Japan, Korea. The distinctions given by Jordan and Herre for comparison with Saurida tumbil do not seen to hold as my specimens of the latter are marked exactly as in the present species. The adipose eyelids of Saurida eso is wide, a character, however, difficult to estimate without direct comparison.

37758 U. S. N. M. Korea. J. B. Bernadou. Length 175? mm.

57847 U. S. N. M. Wakanoura, Japan. D. S. Jordan and J. O. Snyder. Length 336 mm. Type.

Genus Harpodon Le Sueur

Harpadon LE SUEUR, Journ. Acad. Nat. Sci. Philadelphia, vol. 5, 1825, p. 50. Type Salmo (Harpadon) microps LE SUEUR, monotypic.

Harpodon GUNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 401. Type Salmo (Harpadon) microps LE SUEUR.

Triurus SWAINSON, Nat. Hist. Animals, Fishes, vol. 2, 1839, p. 288. Type Triurus microcephalus SWAINSON, monotypic.

Sauridichthys BLEEKER, Nat. Tijds. Nederland. Indië, vol. 15, 1856, p. 163. Type Saurus ophiodon VALENCIENNES.

Body elongate, compressed. Head rather small, robust. Snout very short, rounded. Eye small, greatly advanced. Mouth cleft deep, upper edge formed by thin tapering premaxillary. No maxillaries. Mandible protruded. Teeth cardiform, recurved, unequal, depressible, largest in jaws, more or less barbed. Palatines and tongue with teeth. Gill openings wide, membranes free from isthmus. Branchiostegals 17 to 25. Skeleton rather fine. Air bladder small or absent. Pyloric appendages 16. Intestine short. Scales thin, cycloid, deciduous, none anteriorly on body. Lateral line axial, complete. Dorsal short, inserted premedian. Adipose fin present. Anal postmedian. Caudal forked or trilobate.. Pectoral placed high, small or long. Ventral moderate or long.

Analysis of species

a^1. Harpadon. Scales present only on posterior part of body.

b^1. Pectoral less than head.

c^1. Pectoral 1 1/3 in head. translucens.

c^2. Pectoral 2 1/4 to 3 1/4 in head. microchir.

b^2. Pectoral equal or greater than head with age. nehereus.

a^2. Peltaharpadon new subgenus. Body more or less covered with scales, also part of head, though anteriorly most deciduous. squamosus.

Harpadon translucens Kent

Harpodon translucens KENT, Proc. Royal Soc. Queensland,

vol. 6, No. 5, 1889, pp. 222, 234, pl. 13, fig. 2.

Ord River, Cambridge Gulf, North Australia.

Depth 7; head 4 1/4 (4 1/2 description). Snout 8 3/4 in head from snout tip; eye 9, 1 1/8 in snout; premaxillary extends 5 1/2 eye diameters behind eye, length 5 4/5 in head from snout tip; teeth slender, recurved, uneven, minutely uncinate, lower longest, some at mandibular symphysis on outer surface project forward.

Scales minute, cycloid, only on hind part of body.

D. I, 15 (14 in description), second ray 1 1/8 in total head length; adipose fin 2 3/4; A. 13 (15 in description), first ray 2 4/5; caudal 1, widely forked (with central hind lobe behind in description); least depth of caudal peduncle 4 1/4; pectoral 1 1/3; ventral 1 + 1/8, rays 9.

Transparent, with minute black speckling along dorsal surface. Iris peacock blue. Length 125 mm. (Kent.)

North Australia.

Harpadon microchir Günther

Harpodon michrochir GUNTHER, Ann. Mag. Nat. Hist., ser. 5, vol. 1, 1878, p. 487. Off Tokyo, Japan; Rep. Voy. Challenger, vol. 1, pt. 6, 1880, p. 71 (types); vol. 22, 1887, p. 180 (types). -- GOODE and BEAN, Oceanic Ichth., 1896, p. 59 (reference).

-- JORDAN and HERRE, Proc. U. S. Nat. Mus., vol. 32, 1907, p. 522, fig. 2 (entrance Tokyo Bay).

Depth 7 1/3 to 9 3/4; head 5 to 5 1/3, width 2 7/8 to 3. Snout 5 1/5 to 6 in head from snout tip; eye 9 to 10 3/4, 1 1/2 to 2 1/2 in snout, 2 2/3 to 3 1/3 in interorbital; premaxillary extends 4 2/5 to 5 eye diameters behind eye, length 1 2/5 to 1 1/2 in head from snout tip; interorbital 4 to 4 2/3, low, depressed or very slightly convex. Gill rakers 5 + 10 short clusters of 4 to 6 very small spinules; gill filaments equal eye.

Scales 58 to 60 in lateral line to ends of central caudal rays. Scales small on posterior part of body, extend forward on belly to ventral but not to dorsal above lateral line. Scales with 17 to 25 circuli, complete.

D. II, 11, I or II, 12, I, first branched ray 1 2/5 to 1 1/2 in total head length; adipose fin 2 1/4 to 2 1/2; A. I, 14, I, first branched ray 1 4/5 to 2 1/5; caudal 1 1/5 to 1 1/4, emarginate, lobes rounded; least depth of caudal peduncle 3 3/4 to 5; pectoral 2 1/4 to 3 1/4; ventral 1 1/4 to 1 1/3.

Brown above, paler laterally. Under surface of head and body brownish white. Iris silvery gray. Sides of head pale. Dorsal and caudal dark brown like back. Pectoral pale dusky. Anal and ventral whitish.

Japan.

62399 U. S. N. M. Tokyo, Japan. D. S. Jordan and J. O. Snyder. Length 290 to 363 mm. 4 examples.

10213. D. 5565. Dammi Island (N.), S. 69° W., 6 miles (N. 5° 51' 42" E. 120° 30' 30"), between Jolo and Tawi Tawi. In 243 fathoms. Sept. 21, 1909. Length 217 mm. to end of broken tail.

10190, 10291. D. 5566. Dammi Island (N.), S. 67° W., 6.8 miles (N. 5° 52' 12" E. 120° 31'), between Jolo and Tawi Tawi. In 244 fathoms. Sept. 21, 1909. Length 317 to 325 mm.

10141. D. 5567. Dammi Island (N.), N. 81° W., 9 miles (N. 5° 48' E. 120° 33' 45"), north of Tawi Tawi. In 268 fathoms. Sept. 21, 1909. Length 344 mm.

10210, 10212. D. 5549. Jolo Light (Jolo), N. 80° E., 15. 8 miles (N. 6° 1' 15" E. 120° 44' 20"), Jolo Island and vicinity. In 263 fathoms. Sept. 17, 1909. Length 293 to 305 mm.

6518 to 6521. D. 5282. Malavatuan Island (N.), S. 84° W., 6.20 miles (N. 13° 53' E. 120° 26' 45"), China Sea vicinity southern Luzon. In 248 fathoms. July 18, 1908. Length 255 to 388 mm.

6603 to 6605. D. 5290. Matocot Point, S. 50° E., 3.10 miles (N. 13° 40' 9" E. 120° 59' 30"), China Sea, vicinity southern Luzon. In 214 fathoms. July 22, 1908. Length 400 to 487 mm.

6674 to 6676. D. 5296. Matocot Point, S. 63° E., 4.50 miles (N. 13° 40' 9" E. 120° 57' 45"), China Sea, vicinity southern Luzon. In 210 fathoms. July 24, 1908. Length 374 to 470 mm.

6677. D. 5297. Matocot Point, S. 50° E., 5.10 miles (N. 13° 41' 20" E. 120° 58'), China Sea, vicinity southern Luzon. In 198 fathoms. July 24, 1908. Length 345 mm.

8044. D. 5373. Tayabas Light (outer), N. 20° E., 15 miles (N. 13° 40' E. 121° 31' 10"), Marinduque Island and vicinity. In 338 fathoms. March 2, 1909. Length 315 mm.

Harpadon nehereus (Buchanan-Hamilton)

Osmerus nehereus BUCHANAN-HAMILTON, Fishes of Ganges, 1822, pp. 209, 308. Mouths of Ganges.

Saurus nehereus CANTOR, Journ. Asiatic Soc. Bengal, vol. 18, pt. 2, 1849, p. 1253 (Pinang).

Harpodon nehereus GUNTHER, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 401 (China, Chusan, Malay Peninsula, Ganges). -- BLEEKER, Atlas Ichth. Ind. Neerland., vol. 6, 1875, p. 157, pl. (2) 278, fig. 2 (Java, Madura, Sumatra, Pinang, Singapore, Banka, Borneo). -- STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, Math.-natuww. Kl., vol. 102, pt. 1, 1893, p. (Swatow). -- ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 572 (Luzon, Manila, Navotas). -- FOWLER, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, 1904, p. 501 (Padang). -- WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 151, fig. 57 (Bagan Api Api, Balikpapan). -- MORI, Journ. Pan Pacific Research Inst., vol. 3, No. 3, July-Sept. 1928, p. 4 (Korea).

Harpadon nehereus FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1911, p. 569 (Padang example).

Salmo (Harpadon) microps LE SUEUR, Journ. Acad. Nat. Sci. Philadelphia, vol. 5, 1825, p. 48, pl. 3.

Harpadon microps SWAINSON, Nat. Hist. Animals, vol. 2, 1839, p. 288 (reference).

Triurus microcephalus SWAINSON, Nat. Hist. Animals, Fishes, vol. 2, 1839, p. 288 (on Wana motta RUSSELL, Fishes of Coromandel, vol. 2, 1803, p. 55, pl. 171, Vizagapatam).

Saurus ophiodon VALENCIENNES, Hist. Nat. Poiss., vol. 22, 1849, p. 490.

Sauridichthys ophiodon BLEEKER, Act. Soc. Sci. Ind. Neerland., No. 9, vol. 3, 1857-58, p. 3 (Padang); No. 7, vol. 5, 1858-59, p. 2 (Sinkawang, Borneo).

Harpodon ophiodon BLEEKER, Nat. Tijds. Nederland. Indië, vol. 21, 1860, p. 139 (Muntok, Benka); vol. 22, 1860, p. 65 (Benculen); Act. Soc. Sci. Ind. Neerland., vol. 8, (Sumatra 9), 1860, p. 2 (Benculen).

Depth 6; head 4 1/4, width 2 1/2. Snout 6 in head from snout tip; eye 13, premaxillary extends 5 eye diameters behind eye, length 1 1/2 in head from snout tip; interorbital 4, evenly convex. Gill rakers firmly erect slender conic small numerous uniserial teeth, at intervals of 3 or 4 enlarged teeth, all shorter than gill filaments, which twice eye diameter.

Scales in lateral line 42 to caudal base and 7 more on latter, outer over middle point of caudal; 5 above to adipose fin origin, 4 below to last anal ray base. Body naked anteriorly, except lateral line. Caudal base largely scaly.

D. II, 9, I, second simple ray 1 3/4 in total head length; A. III, 12, I, second simple ray 1 3/4; caudal 1 1/4; least depth of caudal peduncle 4 1/2; pectoral ; ventral .

Livid pale brown, trunk largely veutral gray, abdomen more whitish. Fins paler than trunk. uniform. Dorsal and caudal slightly dusky. Iris silvery.

1 example A. N. S. P. Padang, Sumatra. 1904. A. C. Harrison and H. M. Hiller. Length 206 mm.

Peltaharpadon new subgenus

Type Harpodon squamosus Alcock.

Body more or less covered with scales, also part of head, though anteriorly most deciduous.

Harpadon squamosus Alcock

Harpodon squamosus ALCOCK, Ann. Mag. Nat. Hist., ser. 6, vol. 8, 1891, p. 127. N. 15° 56' E. 81° 30½', 240 to 276 fathoms, Bay of Bengal; ser. 6, vol. 10, 1892, p. 356 (Bay of Bengal, 200 to 300 fathoms). -- GOODE and BEAN, Oceanic Ichth., 1895, p. 154 (reference). -- ALCOCK, Journ. Asiatic Soc. Bengal, vol. 65, pt. 2, 1896, p. 332 (reference); Cat. Deep Sea Fishes Indian Mus., 1899, p. 154 (Bay of Bengal, 240 to 281 fathoms); Illustrat. Zool. Investigator, pt. 7, 1900, pl. 30, fig. 1. -- BOULENGER, Ann. Mag. Nat. Hist., ser. 7, vol. 7, 1901, p. 261 (N. 25° 24' E. 57° 27', 230 to 243 fathoms).

Depth 5 3/4; head 3 3/4. Snout 10 2.3 in head from snout tip; eye 9 1/5, slightly greater than snout, equals interorbital; premaxillary extends 3 eye diameters behind eye, length 1 4/5 in head from snout tip; interorbital flat.

Scales 44 in lateral line to caudal base and 5 more out over middle of caudal; 5 above, 5 below, Scales deciduous, less so on hind half of tail.

D. II, 11, first branched ray 1 3/4 in total head; adipose fin 3 2/5; A. II, 13, first branched ray 1 1/3; caudal 1 1/6, deeply forked, median lobe not extended; least depth of caudal peuncle 4; pectoral 1 3/4; ventral 1 1/8.

Hyaline gray. Inside mouth and gill opening slightly pigmented. Peritoneum black. Paired fins and caudal black. Male 190 to 217 mm., female 230 to 267 mm. (Alcock.)

Bay of Bengal.

Genus Bathysaurus Günther

Bathysaurus GÜNTHER, Ann. Mag. Nat. Hist., ser. 5, vol. 2, 1878, p. 182. Type Bathysaurus ferox GÜNTHER, designated by JORDAN, Genera of Fishes, pt. 3, 1919, p. 395.

Body elongate, subcylindrical. Head depressed. Snout produced, flat above. Eye moderate or small, lateral, little advanced. Mouth cleft rather wide, lower jaw projecting. Premaxillary very long, styliform, tapering, not movable. Teeth in wide bands in jaws, not covered by lips, curved, unequal in size and barbed at ends. Series of similar teeth on each palatine, few on tongue and groups of small ones on hyoid. Gill openings wide, membranes separate from each other and from isthmus. Gill rakers tubercular. Pseudobranchiae well developed. Branchiostegals 11 or 12. Scales small. Lateral line axial, complete. Dorsal premedian, rays 18. Adipose fin present or absent. Anal postmedian, moderate. Caudal emarginate. Pectoral moderately large. Ventral inserted close behind pectoral rays 8.

Analysis of species

a[1]. No adipose fin; branched dorsal rays 16. *ferox.*

a[2]. Adipose fin present; branched dorsal rays 8 to 10. *mollis.*

Bathysaurus ferox Günther

Bathysaurus ferox GÜNTHER, Ann. Mag. Nat. Hist., ser. 5, vol. 2, 1878, p. 182. East New Zealand coast; 1100 fathoms; Rep. Voy. Challenger, vol. 22, 1887, p. 181, pl. 46, fig. A (type). -- GOODE and BEAN, Oceanic Ichth., 1895, pp. 58, 510, pl. 18, figs. 65-66 (Gulf Stream, 984 to 1106 fathoms). -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 539 (compiled). -- MURRAY and HJORT, The Depths of the Ocean, 1912, p. 396 (N. 27° to 34° W, 8° to 33°, 2055 to 2685 meters).

Bathysaurus agassizii GOODE and BEAN, Bull. Mus. Comp. Zool., vol. 10, 1882, p. 215. N. 33° 35' 20" W. 76° 647 fathoms, Gulf Stream. -- VAILLANT, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p. 139, pl. 10, figs. 1, a-b (off Morocco, 2200 meters).

Bathysaurus obtusirostris VAILLANT, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p. 136, pl. 10, figs. 2, a-g, pl. 16, fig. 3. Off Cape Verde Islands, 3655 meters.

Depth 5 1/2 to 7; head 3 1/4 to 4, width 2 to 2 2/5. Snout 2 7/8 to 3 in head from snout tip; eye 5 3/5 to 9, 1 3/4 to 3 in snout, 1 to 1 3/4 in interorbital; premaxillary extends 1 to 2 eye diameters behind eye, length 1 1/2 to 1 3/5 in head from snout tip; interorbital 5 1/5 to 5 1/3, largely level, with deep median depression. Gill rakers as row of numerous fine short denticles, greatly less than gill filaments, which equal eye.

Scales 66 to 68 in lateral line to caudal base and 5 more on latter; 10 above, 9 below, 32 predorsal forward to occiput. Scales all very caducous, most all fallen. Scales simple, thin, with 14 circuli basally, though only 5 or 6 extended continuously apically.

D. III, 16, I, first branched ray 1 2/3 to 1 3/4 in total head length; A. III, 9, I or III, 10, I, first branched ray 2 1/2 to 2 7/8; caudal 1 2/5 to 1 2/3, little emarginate; least depth of caudal peduncle 5 to 5 2/3; pectoral 1 1/8 to 1 1/3, rays 15; ventral 1 7/8 to 2 in total head length, rays 8.

Brown. Iris grayish. Inside branchiostegal flap bluish black. Fins all brownish, paired ones darker brown basally.

Atlantic and Pacific Oceans.

38106 U. S. N. M. In 984 fathoms. Albatross Station 2710. Length 780 mm.

43744 U. S. N. M. N. 39° W. 70°

Albatross Station . Length 220 mm.

Bathysaurus mollis Günther

Bathysaurus mollis GÜNTHER, Ann. Mag. Nat. Hist., ser. 5, vol. 2, 1878, p. 182. Middle of South Pacific; off Yeddo; in 1875 to 2385 fathoms; Rep. Voy. Challenger, vol. 22, 1887, p. 183, pl. 46, figs. B-B' (type). -- GOODE and BEAN, Oceanic Ichth., 1895, p. 59 (reference). -- VAILLANT, Res. Camp. Sci. Monaco, vol. 52, 1919, p. 130 (N. 39° 50' W. 17° 58', 4360 meters, east of Azores). -- TOWNSEND and NICHOLS, Bull. Amer. Mus. Nat. Hist. New York, vol. 52, art. 1, May 16, 1925, p. 10, pl. 1, fig. 1 (off west coast southern Lower California, Lat. 23°, 1760 fathoms). -- FOWLER, Mem. Bishop Mus., vol. 10, 1928, p. 66 (copied).

Depth 8 1/4 to 8 2/3; head 3 1/8 to 4, width 2 1/8. Snout 3 4/5 to 4 3/5 in head from snout tip; eye 5 4/5 to 6 1/4, 1 1/4 in snout, 1 1/8 to 1 1/4 in interorbital; premaxillary reaches 1 2/3 to 1 4/5 eye diameters behind eye, length 1 2/5 to 1 1/2 in head from snout tip; interorbital 4 3/4, low.

Scales enlarged 40 to 50 in lateral line to caudal base and 2 more on latter; 10 above, 7 below, 8 rows on opercle.

D. III, 12, I, first branched ray 1 1/6 to 1 1/3 in total head, little less than first simple ray; adipose fin 5 2/3 to 5 7/8; A. III, 8, I or II, 10, I, first branched 1 4/5 to 1 5/6; caudal 1, in young 1 + 1/7, emarginate; least depth of caudal peduncle 4 2/3 to 5 1/10; pectoral 1 1/6; ventral 1 1/8 to 1 1/3.

Whitish. Inside mouth, gill opening and lower parts of body black. Young with 14 narrow vertical bars, extending whole body depth; shorter bar in interspaces not extending upwards above lateral line. Length 191 to 484 mm. (Günther.)

Pacific Ocean. Günther calls attention to the coloration of the young as pattern extremely rare in deep sea fishes.

Genus Bathylaco Goode and Bean

Bathylaco GOODE and BEAN, Oceanic Ichth., 1895, p. 57. Type Bathylaco nigricans GOODE and BEAN, monotypic.

Body elongate, subcylindrical. Head large, conic. Snout short. Eye large, greatly advanced. Maxillary very long, expanded. Mouth very large, oblique, wide, lower jaw projecting. Teeth small, somewhat biserial in front above and uniserial behind; narrow band in mandible. Palatine teeth also in narrow bands. Opercular bones thin, weak. Gill opening very wide, left membranes overlapping right and not attached to isthmus. Gill rakers few, short. Scales apparently absent. Dorsal origin postmedian, fin twice longer than anal. No adipose fin? Caudal forked. Pectoral small, low. Ventral moderate, inserted nearly opposite dorsal origin, rays 8.

Bathylaco nigricans Goode and Bean

Bathylaco nigricans GOODE and BEAN, Oceanic Ichth., 1895, p. 57, pl. 18, fig. 69. Blake Station XXXIX, off Santa Cruz, 2393 fathoms. -- JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 540 (copied).

Depth 6 3/5; head 3 3/4. Snout 7 1/4 in head from snout tip; eye 4 1/4, greater than snout; premaxillary extends 1 2/3 eye diameters behind eye, expansion 1 3/4 in eye, length 1 2/5 in head from snout tip; interorbital 4 1/3, low.

D. 20, height 2? in total head length; A. 11, height 3 1/4?, inserted last third of dorsal base; caudal forked?; least depth of caudal peduncle 3 1/5; pectoral 5?; ventral damaged.

Black. Length 213 mm. (Goode and Bean.)

Atlantic Ocean.